T.O. 33D7-71-42-1

PRELIMINARY

TECHNICAL MANUAL

USE UNTIL OFFICIAL MANUAL IS RECEIVED THROUGH THE TECHNICAL ORDER SYSTEM

OPERATION AND MAINTENANCE INSTRUCTIONS

with ILLUSTRATED PARTS BREAKDOWN

RADIO TEST SET

MODEL ACR/TS-24(B)

NSN 6625-01-128-8588

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ACR ELECTRONICS, INC.

CONTRACT NUMBER

F41608-81-G-0069-0007

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SAFETY SUMMARY

CAUTION

Do not use Test Chamber as storage for any items. Page 1-2

CAUTION

Always remove batteries from radios to be tested. The Test Set interlock that prevents unwanted radiation is active only if radio battery is placed in the DC Test Module and the Test Chamber cover is closed. Page 4-19

CAUTION

Do not attempt to reset Load Carriage with transceiver antenna in Load Carriage. Page 4-26

CAUTION

During the operational checkout, be sure all external power connections to the test set are the correct DC polarity. Page 5-2

CAUTION

During DC Module calibration, be sure external power to DC Module connections are correct DC polarity. Page 5-36

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FOREWORD

The purpose of this manual is to provide the operation and maintenance information required for the ACR/TS-24(B) Radio Test Set manufactured under Pat. No. 4,278,979 by ACR Electronics, Inc., Hollywood, Florida.

Detailed procedures are supplied wherever required. Where no specific direction is provided, standard practice procedures should be used. An Illustrated Parts Breakdown, for maintenance reference, is provided in the last section of this manual.

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Section I. INTRODUCTION AND GENERAL INFORMATION

1-1. INTRODUCTION. This manual contains operation and maintenance information and an Illustrated Parts Breakdown for the ACR/TS-24(B) Radio Test Set. There are seven sections in this manual arranged in the following order:

Section I.	Introduction and General Information
Section II	Special Tools and Test Equipment
Section III	Preparation for Use and Shipment
Section IV	Operation Instructions
Section V	Maintenance Instructions
Section VI	Diagrams
Section VII	Illustrated Parts Breakdown

This manual is the sole reference for the operation and maintenance of this test set.

1-2. GENERAL INFORMATION. The ACR/TS-24(B) Radio Test Set shown in figure 1-1 is for use in the functional testing of the following military emergency transceivers and radio beacons: AN/URT-33, AN/URT-33A, AN/URT-33B, AN/URT-33C, AN/URT-33C/M, AN/PRC-90, AN/PRC-106 and AN/URC-64. The ACR/TS-24(B) basically consists of three Test Chambers: a DC Test Module, an RF Analysis Module,and the various adaptors and mounts necessary to test each of the specified survival transceivers and radio beacons.

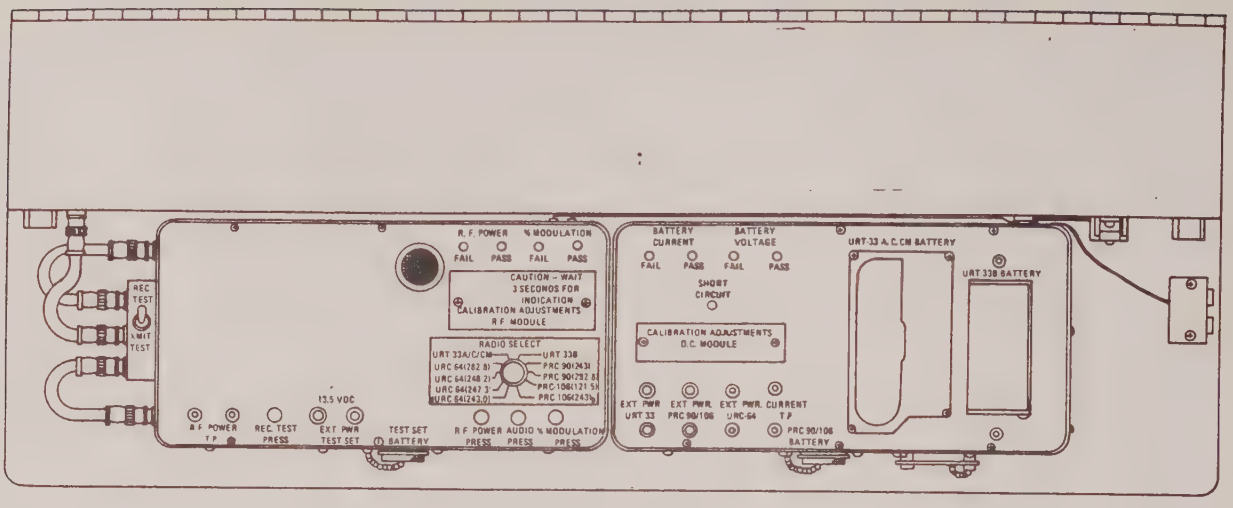


Figure 1-1. ACR/TS-24(B) Radio Test Set

a. Test Chamber. This chamber provides the shielding and loading necessary to simulate operation under field conditions while minimizing interference on emergency channels due to external radiation. An interlock prevents testing until the chamber is closed.

CAUTION

Do not use Test Chamber as storage for any items.

b. DC Test Module. This module monitors battery output to check that operating power is within preset limits during actual unit operation. LED indicators provide pass or fail indications for both voltage and current. Another LED indicator lights if a short circuit condition exists in the input power circuitry of the unit under test. External test points allow for either the metering of battery voltage and current or the use of external power for operation.

c. RF Analysis Module. This module provides the means to test transmitter output and receiver sensitivity. LED indicators provide pass or fail indications for both RF power and modulation. An audio monitor is also provided for testing modulation in beacon mode.

d. Leading Particulars. Table 1-1 lists the leading particulars for the ACR/TS-24(B).

Table 1-1. Leading Particulars

Dimensions: 32 in. long x 4.5 in. high x 12.5 in. deep

Power Requirements:

DC Test Module -	Battery from unit under test.
RF Analysis Module -	Battery P/N BA-4568/U or external 13.5 Vdc.

Adaptors, Mounts and Accessories:

ITEM	QUANTITY (EACH)	ACR MODEL NO.
Test Chamber	1	24-TC
D.C. Test Module	1	24-DCM
R.F. Analysis Module	1	24-RFM
Battery Adapter Module	1	
URT-33A, 33C, 33C/M		24-BAM/URT-33A
Battery Adapter Module	1	
URT-33		24-BAM/URT-33
Battery Adapter Module	1	
URT-33B		24-BAM/URT-33B
Battery Adapter Module	1	
PRC-90 and PRC-106		24-BAM/PRC-90
Battery Adapter Module	1	
URC-64		24-BAM/URC-64
Flex Antenna	1	
URT-33, 33A, 33B, 33C, 33C/M		24-FA
Battery Connector	1	
URT-33		24-BC
Radio Cradle	1	
URT-33, 33A, 33C, 33C/M		24-RC/URT-33
Radio Cradle	1	
URT-33B		24-RC/URT-33B
Radio Cradle*	1	
PRC-90 and PRC-106		24-RC/PRC-90
Radio Cradle*	1	
URC-64		24-RC/URC-64

1-3. CALIBRATION. As an item of test equipment that uses a standard reference, the ACR/TS-24(B) requires scheduled calibration checks, refer to Section V. MAINTENANCE INSTRUCTIONS. If calibration is not current or if during use consistently erroneous indications are suspected, the ACR/TS-24(B) should be checked in a calibration lab.

Section II. SPECIAL TOOLS AND TEST EQUIPMENT

2-1. GENERAL. Table 2-1 lists the standard test equipment required for maintenance of the ACR/TS-24(B). Equivalent test equipment may be used if the recommended item is not available.

Table 2-1. Test Equipment

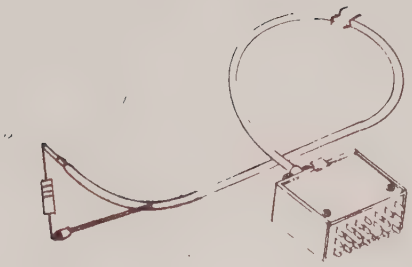
TOOL/ EQUIPMENT NUMBER	FIGURE NO.	NOMENCLATURE	USE and APPLICATION
ACR PN A3-01-0298	2-1	121.5 MHz Calibration Antenna	RF Module calibration
ACR PN A3-01-0299	2-1	243.0 MHz Calibration Antenna	RF Module calibration
ACR PN A3-01-0300	2-1	282.8 MHz Calibration Antenna	RF Module calibration
ACR PN A3-06-0990	2-2	URT-33 Calibration Plug	RF Module testing and calibration
ACR PN A3-06-0991	2-2	PRC-90/106 Calibration Plug	RF Module testing and calibration
ACR PN A3-06-0992	2-2	URC-64 Calibration Plug	RF Module testing and calibration
22-198U or Radio Shack Equivalent		Digital Voltmeter (3½ digit)	Testing, troubleshooting and calibration
HP 608E or equivalent		RF Signal Generator: Freq. Range 100 to 300 MHz Spur. Cont. -40 db max Output Lev. -20 dbm to + 5 dbm adj. Impedance 50Ω output Mod. Lev. 0% to 90% adj.	Testing, troubleshooting and calibration
ZHL-2 Mini-Circuits Inc. or equiv.		RF Power Amplifier: Freq. Range 100 to 300 MHz Gain 30 db ± 5 db Output Lev. 29 db min. for 1 db comp. Impedance 50Ω input and output	Testing, troubleshooting and calibration

Table 2-1. Test Equipment Continued

TOOL/ EQUIPMENT NUMBER	FIGURE NO.	NOMENCLATURE	USE and APPLICATION
CH-132 Anzac or equivalent		Directional Coupler: Freq. Range 100 to 300 MHz Coupling -20 db ± 1 db to coupl. ports Impedance 50Ω all ports Thru loss 1 db max. Directivity 35 db min. Input Power + 33 dbm max.	Testing, troubleshooting and calibration
HP 431B or equivalent		Power Meter: Freq. Range 100 to 300 MHz Impendance 50Ω Input full scale 10mW, 1mW, .1mW .01mW Accuracy 5% of full scale	Testing, troubleshooting and calibration
HP 538 A or equivalent		Frequency Counter	
TU-50 Anzac or equivalent		2-Way Splitter	
HP 8447A (2 in cascade) or equivalent		Precision RF Preamplifier, 40 dB	
Texscan 3dB or equivalent		Attenuator	
Texscan 50 ohm load or equivalent		Dummy Load, 50 ohm	
922 Textronix or equivalent		Oscilloscope	

Use RG58/U coaxial cable and insulated test leads as required.

Figure 2-1. Calibration Antennas



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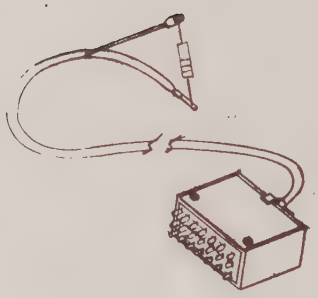

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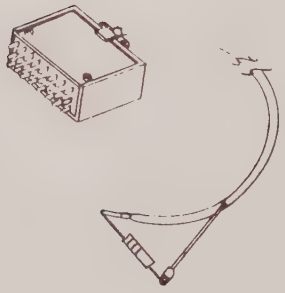


Figure 2-2. Calibration Plugs

2-2. TEST EQUIPMENT MAINTENANCE. Voltmeters, ohmmeters, signal generators, frequency counters, power meters, and oscilloscopes used in the maintenance and calibration of the ACR/TS-24(B) Radio Test Set must also be calibrated on a periodic schedule. No other special maintenance is required for the recommended items.

Section III. PREPARATION FOR USE AND SHIPMENT

3-1. PREPARATION FOR USE. The ACR/TS-24(B) is powered by batteries and/or an external regulated dc power source. Power sources must be installed or connected prior to use.

NOTE

Where a good ground terminal is available, the Test Chamber may be grounded to the terminal by means of a braided ground strap. This step will further attenuate radiation below the 35 dB minimum attenuation specified for the ungrounded Test Set.

a. Battery Power. For complete battery operation, a battery P/N BA-1568/U must be installed in the RF Analysis Module battery well labeled TEST SET BATTERY. The DC Test Module and the transceiver/radio beacon under test require the use of the battery for the unit under test. Insert the battery for the unit under test into the appropriate battery well of the DC Test Module.

b. External Power. A regulated +13.5 VDC power source is required for the RF Analysis Module. Apply +13.5 VDC at the terminals labeled 13.5 VDC EXT. PWR. TEST SET. Be sure to observe correct polarities when connecting external power. The unit under test receives power through the DC Test Module. Depending on the unit being tested, either a +7.8, +12.0 or +13.5 VDC regulated power source is required. Make the following external power connections to the DC Test Module as required:

VOLTAGE			DC TEST MODULE INPUT TERMINALS
+7.8	VDC	to/for	EXT. PWR. URT-33( )
+12.0	VDC	to/for	EXT. PWR. PRC 90/106
+13.5	VDC	to/for	EXT. PWR URC-64

3-2. INSTALLATION CHECK. Perform the Operational Checkout in Section V. MAINTENANCE INSTRUCTIONS of this manual to determine serviceability of the ACR/TS-24(B).

Section IV. OPERATION INSTRUCTIONS

4-1. THEORY OF OPERATION. The ACR/TS-24(B) theory of operation will be presented in three parts. These parts correspond to the modular and functional breakdown of the test set. The order of presentation does not represent any priority or significance in relation to hardware or function.

a. DC Test Module. The DC Test Module has three primary functions; voltage selection, voltage monitoring and current monitoring (refer to figure 4-1). Since the Battery Adapter Modules function as an integral part of the DC Test Module, they are also included in this part of the theory.

(1) Voltage Selection. This is basically a function of the battery/battery well used or the EXT. PWR. (URT-33, URC-64, PRC-90/106) test points used to apply power. Table 4-1 shows the radio power requirements with regard to the external test point.

Table 4-1. External Power Voltage Reference

EXT. POWER TEST POINT	VOLTAGE REQUIREMENT
URT-33	7.8 volts
URC-64	12.0 volts
PRC-90/106	13.5 volts

NOTE

The EXT. PWR. test points can also be used to meter radio battery operating voltage when battery power is used.

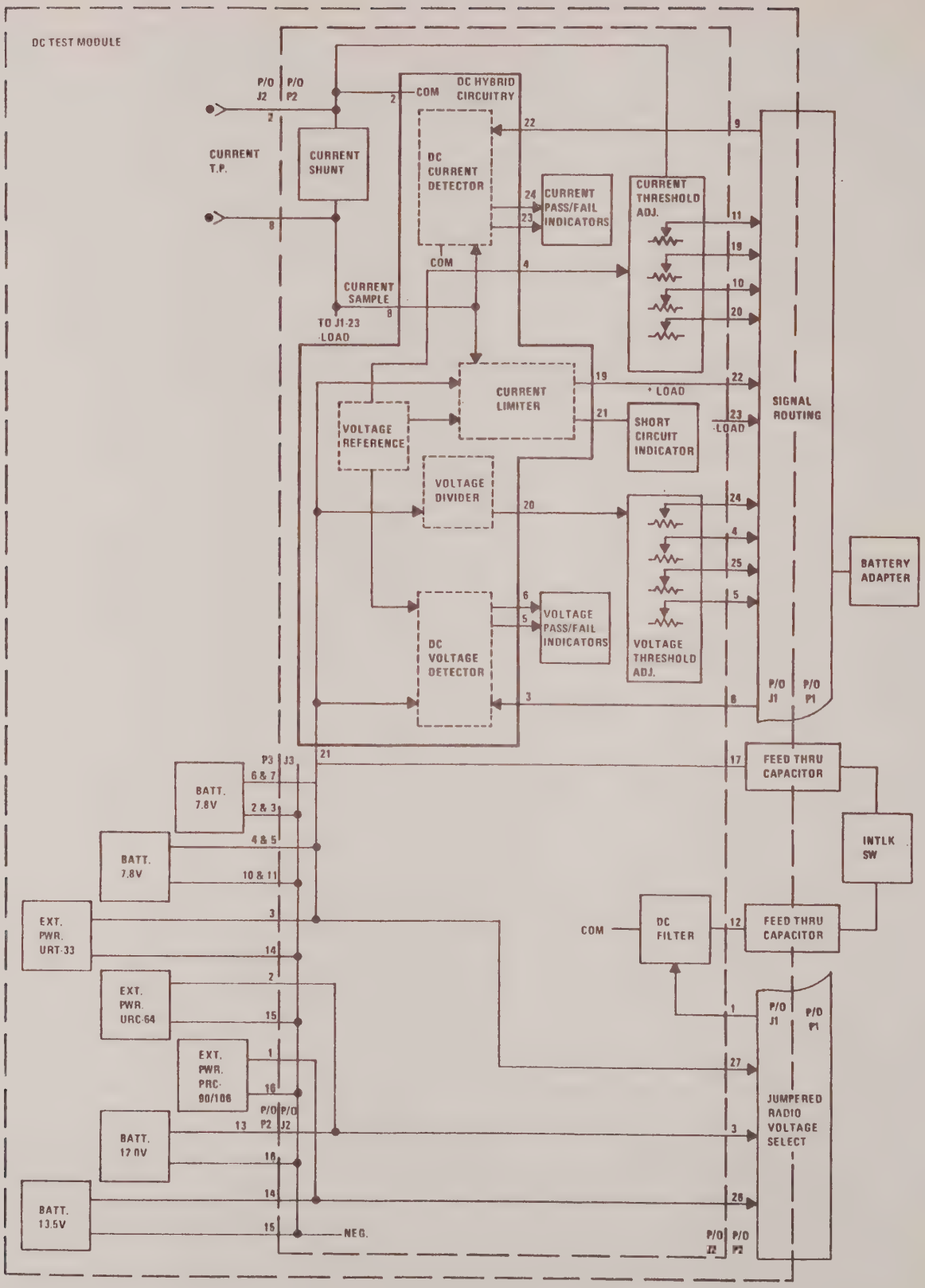


Fig. 4-1. DC Module Simplified Block Diagram

The external power test points and the battery terminals common to each voltage requirement are connected internally and routed to separate pins of chassis mounted connector J1. Connector P1 of each battery adapter is wired to pick up only the voltage required for its respective radio. The required voltage is then routed via P1/J1 pin 1, to the Interlock Switch mounted on the Test Chamber and back to the DC Test Module.

(2) Voltage Monitor. The voltage monitoring function is primarily accomplished within a portion of the DC Hybrid Microcircuit IC1. The input voltage is picked up at IC1-21, dropped thru an IC1 Voltage Divider and applied, from IC1-20, to Voltage Threshold Adjustment variable resistors R2A, B, C and D for voltage threshold settings.

The purpose of the Voltage Divider is to expand the sensitivity adjustment range of the voltage threshold resistors. Each threshold adjustment wiper is connected to its respective pin of connector J1. Connector P1 of each battery adapter is wired to only the wiper that sets the threshold for the corresponding voltage of the unit under test. This threshold voltage setting is then jumpered within P1 and returned to a DC Voltage Detector thru P1/J1 pin 6 and IC1-3. Additionally, a Voltage Reference Circuit provides a standard for use in establishing both the voltage and the current thresholds. The Voltage Detector uses a sample from the IC1-21 input, the IC1 Voltage Reference Standard, and the threshold input from IC1-3 to provide a pass or fail signal to BATTERY VOLTAGE FAIL PASS indicators LED 1 and LED 3 thru either IC1-5 or IC1-6.

(3) Current monitor. Current monitoring provides two different indications. One is a current fail or pass indication and the other a short circuit indication. A majority of the current monitoring function occurs

within a part of the DC Hybrid Microcircuit IC1. The battery current fail or pass indication is provided as a means of determining battery current acceptability. To accomplish this a Voltage Reference is derived within IC1 and applied thru IC1-4 to Current Threshold Adjustment variable resistors R1A, B, C and D for current threshold settings. Each threshold adjustment wiper is connected to its respective pin of connector J1. Connector P1 of each battery adaptor is wired to only the wiper that sets the threshold for the corresponding current of the unit under test. This threshold current setting is then jumpered within P1 to P1/J1-9 and returned to a DC Current Detector vice IC1-22. Simultaneously a current sample is taken from a Current Shunt and routed to the same DC Current Detector thru IC1-8. As long as the Current Detector does not sense a current in excess of the set threshold, the pass indicator LED 2 is illuminated thru IC1-24. If current does exceed the set threshold a fail signal is present at IC1-23 to illuminate the fail indicator LED 4. For short circuit monitoring, the same voltage reference used for current fail/pass is used and applied to a current limiting circuit. Although the primary function of R1A thru D is to set the current threshold limits, the parallel resistance of these variable resistors additionally functions as a voltage drop standard for the voltage reference input to the Current Limiter. This Current Limiter, comprised of IC1, Q1 and R5, uses the voltage reference and the current sample from IC1-8 to limit the output load current to a maximum of 300 milliamps. The output load current, thru the Current Limiter, again comes from IC1-21 and goes out to the unit under test thru J1/P1-22. If the output load current reaches the 300 milliamp limit the Current Limiter also illuminates SHORT CIRCUIT indicator CR5.

b. RF Analysis Module. The function of the RF Analysis Module is to provide either an audible or visual indication of acceptability for each of the RF signal component parts. The RF level, modulation percentage and audio characteristics can all be tested for conformance to predetermined operational limits. Both transmit and/or receive functions of a unit can be tested. Figure 4-2 provides a simplified block diagram that is to be reference for the remaining description of the module.

NOTE

Although the REC TEST XMIT TEST switch located on the left side of the RF Analysis Module does not select function, it does control the RF signal path and must be set correctly to perform functional testing.

(1) Radio Transmit Tests Theory. The Radio Select Switch is a two wafer switch used to select the correct frequency and calibrated threshold for the unit under test. Only level 1 is used for transmit testing. Each threshold wiper of RF Power and % Modulation Calibration variable resistors 1R6A-D, 1R7A-D, and 1R8A-B is connected to a respective Radio Select Switch level 1 position. The selected threshold is routed to an RF Level Detector, within RF Hybrid Microcircuit IC4, thru 1P4/1J4-18 and IC4-16. When the radio is keyed to transmit, coaxial cable routes the RF signal from the Test Chamber to the REC TEST XMIT TEST switch. The RF then passes thru a Low Pass Filter to an AM Detector via IC4-3. The AM Detector is active anytime one of the Mode Switches is depressed. The AM Detector demodulates the incoming RF waveform and presents the envelope at its output. The output is

connected within IC4 to the RF Level Detector, the % Modulation Detector and an Audio Amplifier.

(a) RF Power. Externally to IC4, the AM Detector output is connected to a True RMS/DC Converter and % Modulation Threshold variable resistor R8D from IC4-5. The TRUE RMS/DC is also active anytime a Mode Switch is depressed.

NOTE

Negative 5 VDC is also required by the TRUE/RMS DC Converter. This voltage is obtained by sampling the 1 KHz Generator output and applying the sample to the negative 5 VDC Power Supply for rectification and filtering.

The Converter provides a DC voltage output proportionate to the RF RMS voltage received from the unit under test. This DC equivalent is returned to the RF Level Detector thru IC4-14 and is also present at the R.F. POWER T.P. for external voltmeter monitoring, if required. The RF Level Detector compares the DC equivalent with the preset threshold level and provides a return for either the R.F. POWER FAIL (LED 4) or PASS (LED 3) indicator thru IC4-17 or 18 respectively. Depressing the R.F. POWER PRESS Mode Switch pushbutton provides a +10.1 VDC to both R.F. POWER indicators. The indicator with a return provided by the RF Level Detector then illuminates to indicate RF power fail/pass acceptability.

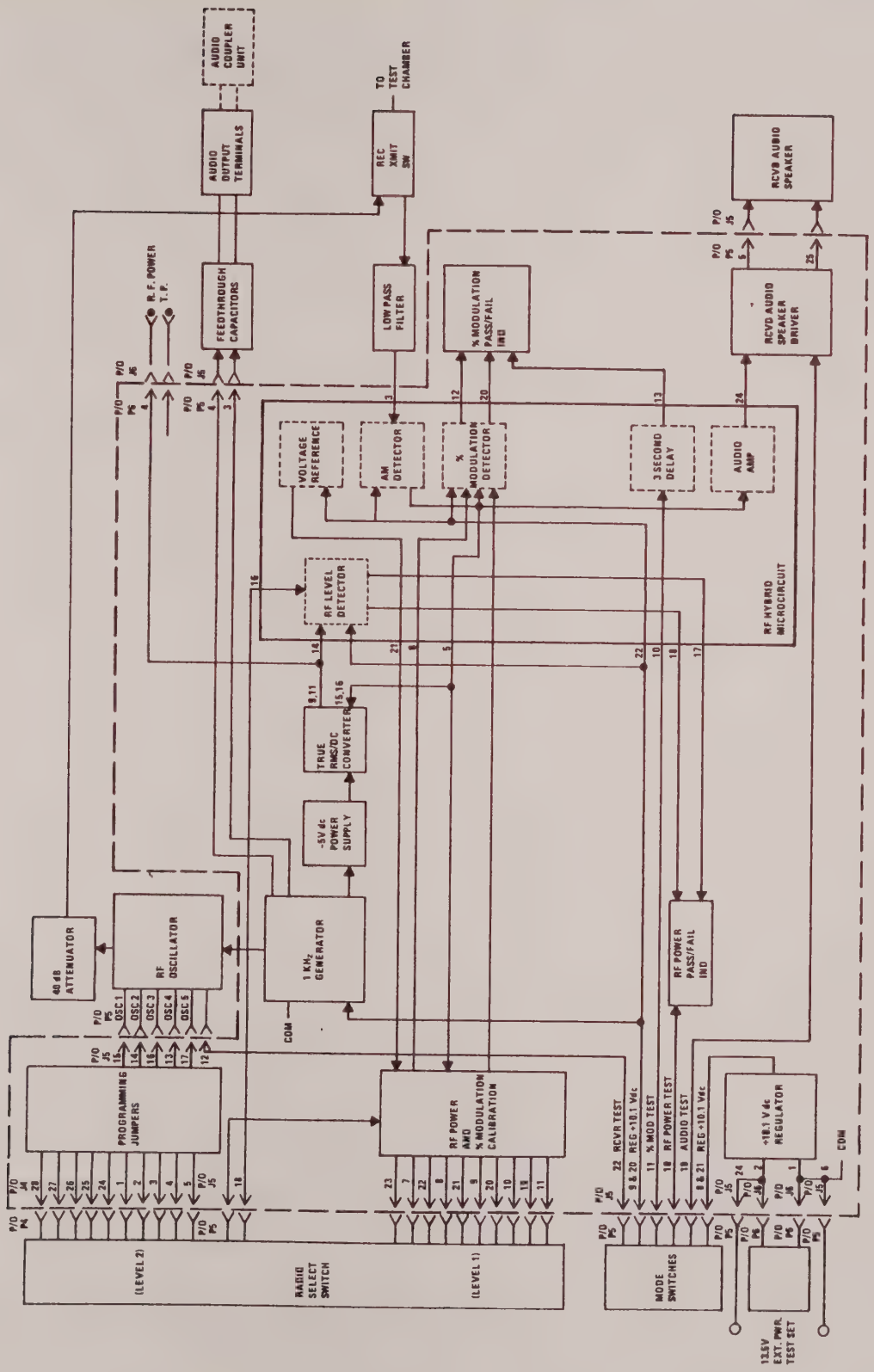


Figure 4-2. RF Analysis Module Simplified Block Diagram

(b) Audio Received. The AM Detector output is again used to check received audio, such as beacon and MCW, from the unit under test. An Audio Amp is always active if a Mode Switch is depressed. The AM Detector output is amplified by this Audio Amp and applied to a RCVD Audio Speaker Driver thru IC4-24. The RCVD Audio Speaker Driver is functional only when the AUDIO PRESS Mode Switch pushbutton is depressed to provide 10.1 VDC. The received audio signal is then applied to the front panel mounted speaker of the RF Analysis Module. To determine fail/pass modulation percentage, a standard reference audio must be input at the microphone/speaker of the unit under test. This reference standard is provided by the 1 kHz Generator via 1P6/1J6-4, 1P6/1J6-3, and Feedthrough Capacitors, to the Audio Output Terminals located on the right side TS-24(B) base.

NOTE

An Audio Coupler Unit, that is physically mounted on the radio cradle, is then plugged into the Audio Output Terminals and placed over the radio microphone/speaker.

(c) Modulation Percentage. The % MODULATION FAIL PASS indication is obtained in much the same way as RF power. Basically a % Modulation Detector compares the peak-to-peak modulation against the averager RF level of the modulation envelope. To accomplish this the % Modulation Detector uses the AM Dector output and the % Modulation Threshold setting to determine % Modulation Acceptability. If the Modulation Percentage is above the preset threshold, a signal path is provided for the green % MODULATION PASS indicator LED 2 via TC4-20. If threshold minimum is not met, a signal path for % MODULATION

FAIL indicator LED 1 is provided thru IC4-12. Neither % MODULATION indicator can illuminate until a three second time-out delay has occurred. This 3 Second Delay circuit begins timing after 10.1 VDC is provided by depressing the % MODULATION PRESS Mode Switch pushbutton. When three seconds have passed, the 3 Second Delay completes the appropriate signal path to illuminate either the fail or pass indicator.

(2) Radio Receive Test Theory. The RF Oscillator is capable of generating five different frequencies. The correct frequency is selected using level 2 of the Radio Select Switch and the prewired Programming Jumpers. The switch position of the level 2 wafer provides a common line to a predetermined input of the Programming Jumpers. The Programming Jumper configuration then determines which one of five Oscillator frequencies will be enabled. Power to start and operate the Oscillator is applied thru IP5/1J5-22 when the REC. TEST PRESS Mode Switch pushbutton is depressed. A 1 kHz modulation input signal is supplied to the Oscillator modulator thru 1P5/1J5-18 and 3P1/3J1-7. The modulated RF signal is then applied to a 40 dB Attenuator via coax 4J2/4P2. The attenuator output is then routed from 1P3/1J3 thru coax to the REC TEST XMIT TEST switch. With this switch set to REC TEST, the modulated RF signal is routed to the Test Chamber for reception by the unit under test. If the radio is receiving, the 1 kHz signal can be heard from the microphone/speaker of the tested unit.

4-2. OPERATING CONTROLS, INDICATORS, AND ACCESSORIES. Table 4-2 provides the purpose and use of controls, indicators and accessories. The table is subdivided and referenced by the three main subassemblies and the accessories. Figure 4-3 identifies each referenced item.

Table 4-2. Purpose and Use of Controls, Indicators and Accessories

ITEM	PURPOSE AND/OR USE
RF Analysis Module:	
R.F. POWER FAIL	Illuminates if RF power test is below an acceptable preset threshold level.
R.F. POWER PASS	Illuminates if RF power test is above the minimum acceptable preset threshold level.
% MODULATION FAIL	Illuminates if % modulation test is below an acceptable preset threshold level.
% MODULATION PASS	Illuminates if % modulation test is above the minimum acceptable preset threshold level.
SPEAKER	Provides an audible indication for the audio test.
RADIO SELECT	Provides radio type and frequency selection for test purposes.
REC. TEST PRESS	Pushbutton switch used to initiate the receive test.
R.F. POWER PRESS	Pushbutton switch used to initiate the RF power test.
AUDIO PRESS	Pushbutton switch used to initiate the audio test.
% MODULATION PRESS	Pushbutton switch used to initiate the modulation percentage test.

Table 4-2. Purpose and Use of Controls, Indicators and Accessories continued

ITEM	PURPOSE AND/OR USE
R.F. POWER T.P.	Test points used for external monitoring of RF power using a DC voltage proportionate to the RF output.
13.5 VDC EXT. PWR. TEST SET	Test points used either to check the RF Analysis Module battery voltage or to apply 13.5 VDC to the module in place of the battery.
REC. TEST XMIT TEST	Toggle switch used to route RF to/from the RF Analysis Module, to/from the Test Chamber.
DC Test Module:	
BATTERY CURRENT FAIL	Illuminates when tested battery current is below an acceptable preset level during actual radio operation.
BATTERY CURRENT PASS	Illuminates when tested battery current is above the minimum acceptable preset level during actual radio operation.
BATTERY VOLTAGE FAIL	Illuminates when tested battery voltage is below an acceptable preset level during actual radio operation.
BATTERY VOLTAGE PASS	Illuminates when tested battery voltage is above the minimum acceptable preset level during actual operation.

Table 4-2. Purpose and Use of Controls, Indicators and Accessories continued

ITEM	PURPOSE AND/OR USE
SHORT CIRCUIT	Illuminates when battery current draw is 300 milliamps or more.
EXT. PWR URC-33	Test points used either to check the 7.8 V battery voltage or to apply a regulated 7.8 VDC for URT-33 testing operation.
EXT. PWR. PRC 90/106	Test points used either to check the 13.5 V battery voltage or to apply a regulated 7.8 VDC for PRC-90/106 testing operation.
EXT. PWR. URC-64	Test points used either to check the 12.0 V battery voltage or to apply a regulated 12.0 VDC for URC-64 testing operation.
CURRENT T.P.	Test point used to check battery current draw during actual radio operation.
Test Chamber:	
LOAD CARRIAGE ASSEMBLY	Used to provide the specific antenna loading requirements for testing and evaluating the radio under test.
Accessories:	
BATTERY ADAPTER MODULE URT-33; P/N 24-BAM/URT-33	Used to provide the correct power and jumper connections to/from the DC Test Module and the URT-33 radio.

Table 4-2. Purpose and Use of Controls, Indicators and Accessories continued

ITEM	PURPOSE AND/OR USE
BATTERY ADAPTER MODULE URT-33A, 33C, 33C/M; P/N 24-BAM/URT-33A	Used to provide the correct power and jumper connections to/from the DC Test Module and the URT-33A, 33C and 33C/M radios.
BATTERY ADAPTER MODULE URT-33B; P/N 24-BAM/URT-33B	Used to provide the correct power and jumper connections to/from the DC Test Module and the URT-33B radio.
BATTERY ADAPTER MODULE PRC-90 and PRC-106; P/N 24-BAM/PRC-90	Used to provide the correct power and connections to/from the DC Test Module and the PRC-90 and PRC-106 radios.
BATTERY ADAPTER MODULE URC-64; P/N 24-BAM/URC-64	Used to provide the correct power and jumper connections to/from the DC Test Module and the URC-64 radio.
BATTERY CONNECTOR URT-33; P/N 24-BC	
RADIO CRADLE URT-33, 33A, 33C, 33C/M P/N 24-RC/URT-33	Provides correct mounting and positioning between the Test Chamber and URT-33, 33A 33C, and 33C/M radios.
RADIO CRADLE URT-33B; P/N 24-RC/URT-33B	Provides correct mounting and positioning between the Test Chamber and the URT-33B radio.
RADIO CRADLE PRC-90 and PRC-106; P/N 24-RC-PRC-90	Contains an audio coupler for use in testing and provides correct mounting and positioning between the Test Chamber and the PRC-90 and PRC-106 radios.

Table 4-2. Purpose and Use of Controls, Indicators and Accessories continued

ITEM	PURPOSE AND/OR USE
RADIO CRADLE URC-64; P/N 24-RC/URC-64	Contains an audio coupler for use in testing and provides correct mounting and positioning between the Test Chamber and the URC-64 radio.
FLEX ANTENNA URT-33, 33A, 33B, 33C, 33C/M; P/N 24-FA	Auxiliary antenna required for complete testing of URT-33, 33A, 33B, 33C and 33C/M antennas.

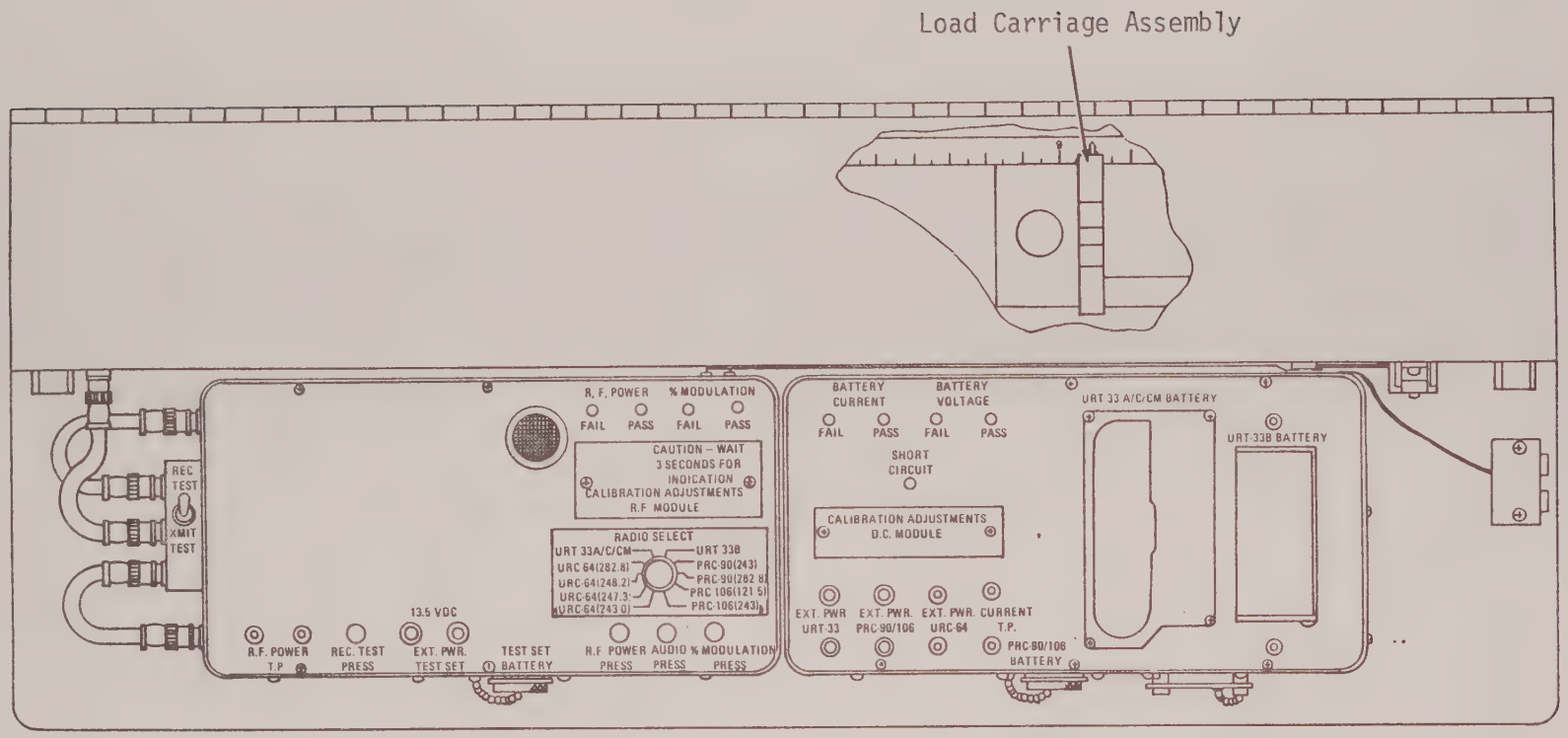


Figure 4-3. Controls, Indicators, and Accessories Identification
(Sheet 1 of 2)

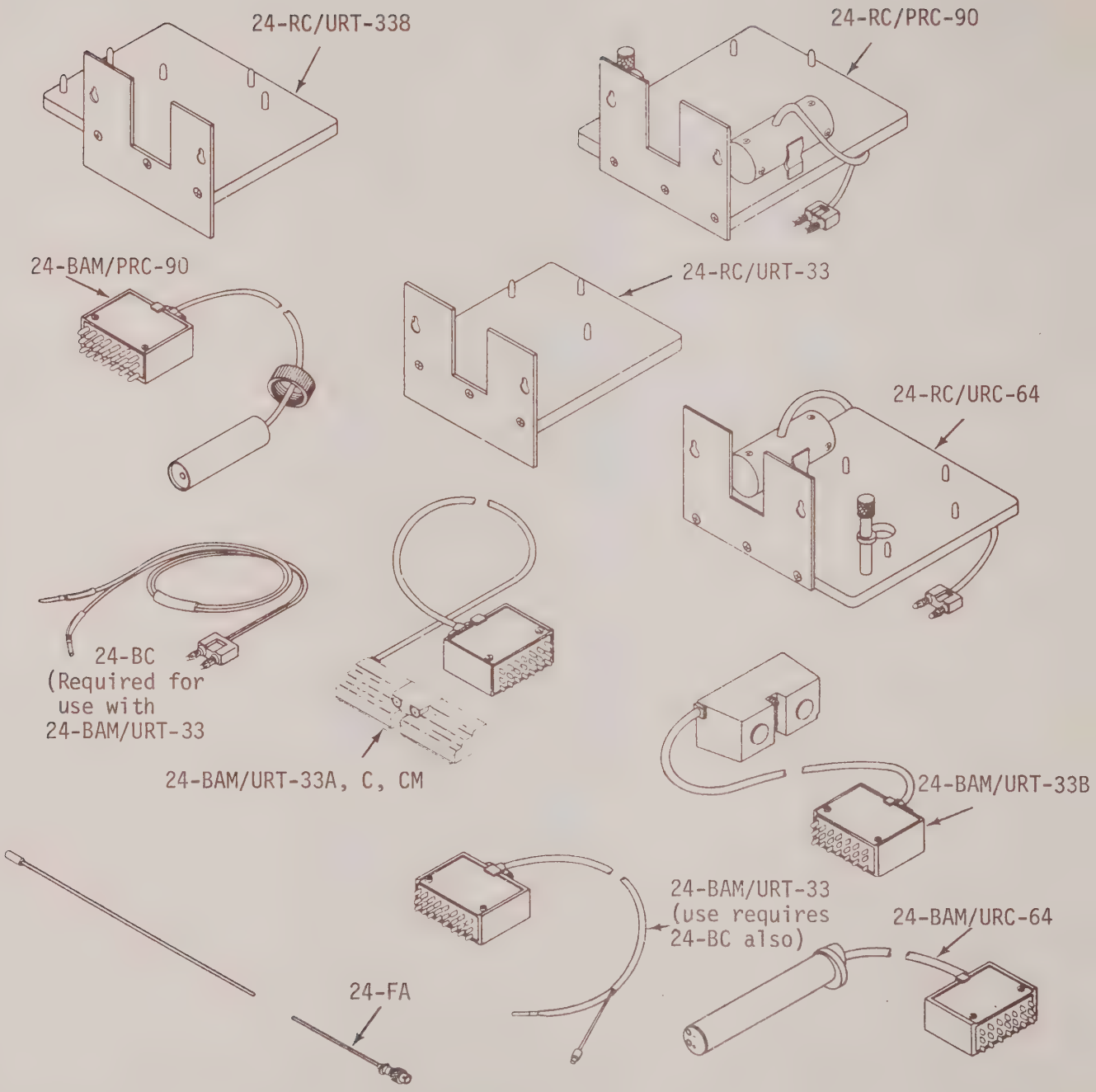


Figure 4-3. Controls, Indicators, and Accessories Indentification

(Sheet 2 of 2)

4-3. OPERATION INSTRUCTIONS. Operation instructions are organized so that complete testing of one channel of a two-channel survival radio may be accomplished without requiring re-setting of the Load Carriage inside the Test Chamber of the set (i.e., all transmitter and receiver tests are completed on one channel before undertaking transmitter and receiver tests on the second channel). Figure 4-4 shows the Test Chamber Load Carriage

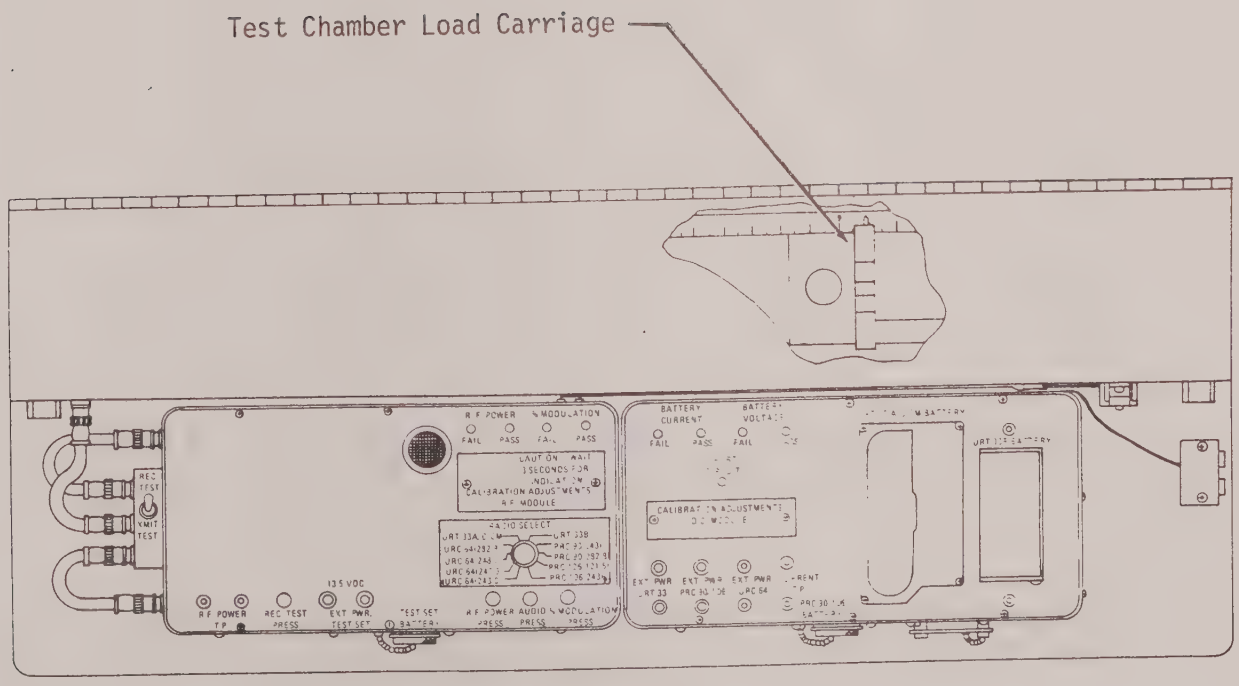
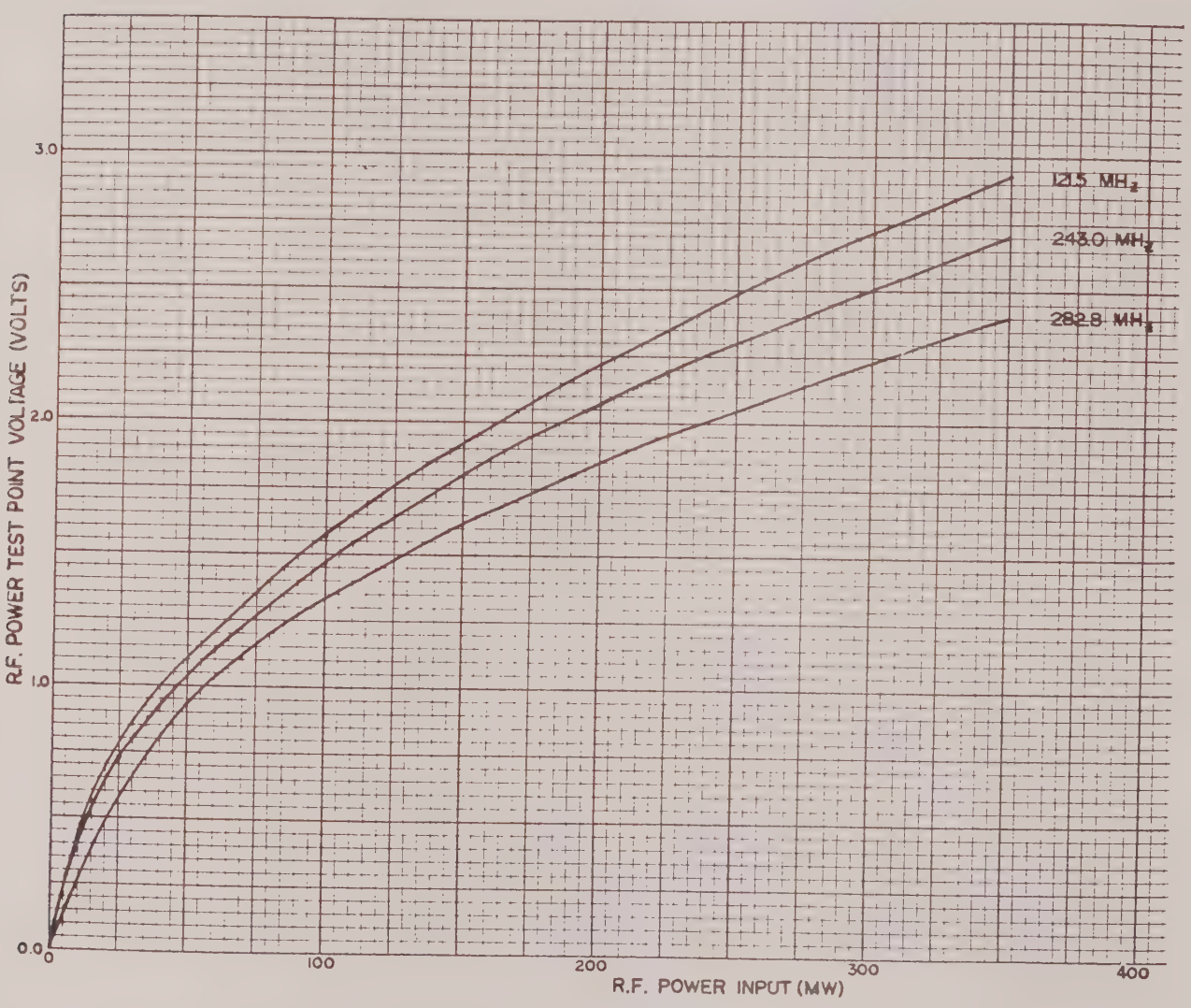


Figure 4-4. Test Chamber Load Carriage

The graph in figure 4-5 provides a means of determining approximate RF power output if more than an R.F. POWER pass/fail indication is desired. Each of the following test procedures note when to use the graph in figure 4-5.



NOTE: Typical data; not to be used as specific testing parameter.

Figure 4-5. RF Power Output vs DC Voltage Reading at RF Test Points.

CAUTION

Always remove batteries from radios to be tested. The Test Set interlock that prevents unwanted radiation, is active only if radio battery is placed in the DC Test Module and the Test Chamber cover is closed.

NOTE

When testing many radios of the same type, time can be saved by performing the same functional test on all the radios before proceeding to the next functional test. Then proceed by resetting the Test Set for the next function to be tested and repeating the process. This will eliminate the time consuming process of resetting each Test Set function for each complete testing of one radio at a time.

a. Initial Test Setup. The initial test setup is the same for all transceivers and beacons. Refer to figure 4-3 and perform initial setup procedures below.

(1) Set RF Analysis Module RADIO SELECT switch to the position for unit and frequency to be tested.

NOTE

If more than one frequency is applicable, begin with lowest frequency.

(2) Unlatch and open Test Chamber cover.

(3) Refer to Table I, located on the inside of the Test Chamber cover, for load scale setting information on the unit under test.

NOTE

If more than one frequency is applicable, begin with lowest frequency.

(4) Loosen load carriage position securing knob. Slide load carriage to set pointer at the guide scale setting obtained in step (3). Lightly tighten position securing knob to secure load carriage at this setting.

(5) Using table 4-3, select the correct radio cradle and battery adapter for the unit to be tested.

Table 4-3. Associated Radio/Radio Cradle/ Battery Adapter

RADIO	RADIO CRADLE	BATTERY ADAPTOR
URT-33	24-RC/URT-33	24-BAM/URT-33 (With Battery Connector 24-BC connected to EXT. PWR. URT-33)
URT-33A, 33C, 33C/M	24-RC/URT-33	24-BAM/URT-33A
URT-33B	24-RC/URT-33B	24-BAM/URT-33B
URC-64	24-RC/URC-64	24-BAM/URC-64
PRC-90, 106	24-RC/PRC-90	24-BAM/PRC-90

(6) Attach radio cradle to key slots on the end of the Test Chamber.

(7) Remove battery from unit to be tested. Install battery adapter in the unit in place of battery.

NOTE

URT-33 Beacon requires removal of backplate to remove battery. Connection of URT-33 battery leads to DC Module (EXT. PWR. URT-33) is made by using pigtails of 24-BC contained in Accessories Kit. URT-33 connects to DC Module via 24-BAM/URT-33

(8) Fully extend antenna of unit under test. Place unit on mounting cradle and press antenna between load carriage contacts.

NOTE

Failure to fully extend antenna and place it into and between the load carriage contacts may result in erroneous parameter measurements.

(9) Close and latch Test Chamber cover.

(10) Connect remaining battery adapter plug P1 to DC TEST MODULE at J1. Insert battery removed from unit into correct DC TEST MODULE battery well.

Initial setup test complete.

b. AN/URT-33 (A) (B) (C) (C/M) Beacon Radio Test.

NOTE

Refer to figure 4-3 for Test Set switch, indicator and test point locations.

(1) Pull lanyard plug from radio.

(2) Be sure URT-33B, URT-33C or URT-33C/M Beacon is set to normal mode.

(3) Set beacon ON OFF switch to ON.

(4) Perform Initial Test Setup paragraph 4-3 a.

(5) Set XMIT TEST RCV TEST switch to XMIT TEST.

(6) Observe all DC Test Module LED indicators. If both BATTERY CURRENT and BATTERY VOLTAGE green PASS indicators are illuminated and SHORT CIRCUIT indicator is not illuminated, proceed to step (7). If red/over current. If red FAIL indicator for either BATTERY CURRENT or BATTERY VOLTAGE is illuminated, replace battery and recheck. If either red FAIL indicator is still illuminated after replacing battery, reject radio for indicated malfunction.

(7) Momentarily depress R.F. POWER PRESS pushbutton. Observe R.F. POWER indication. If green PASS indicator is illuminated, proceed to step (8). Reject radio if R.F. POWER red FAIL indicator is illuminated.

NOTE

An approximate RF power output reading can be obtained by using a VOM as a dc voltage monitor at RF POWER T.P. Record VOM reading with R.F. POWER PRESS pushbutton depressed. Use figure 4-5 to determine the approximate power output based on the dc voltage reading previously recorded.

(8) Momentarily depress AUDIO PRESS pushbutton. If characteristic radio beacon sweep tone is heard, proceed to step (9). Reject radio if no tone or a steady tone is heard.

(9) Unlatch and open Test Chamber cover. Remove radio and collapse telescoping antenna. Connect Flex Antenna P/N 24-FA, from accessories kit, to radio connector.

NOTE

Due to shunt capacity of the stored telescoping antenna, RF power indications in the following steps may be lower than in the previous steps.

(10) Refer to Table I, located on the inside of the Test Chamber cover for load scale setting information for URT-33 with Flex Antenna.

(11) Loosen load carriage position securing knob. Slide load carriage to set pointer at the guide scale setting for URT-33 243.0 MHz flex antenna. Lightly tighten position securing knob to secure load carriage at this setting.

(12) Reinstall radio in Test Chamber. Close and latch cover. Repeat steps (7) and (8).

(13) Remove battery from DC Test Module. Unlatch and open Test Chamber cover. Remove radio from Test Chamber. Remove Flex Antenna from radio and store antenna.

(14) Set beacon ON OFF switch to OFF. Reinstall lanyard plug in radio. Reinstall battery in radio.

AN/URT-33(A) (B) (C) (C/M) Beacon Radio Test complete.

c. AN/PRC-90 Transceiver Test.

NOTE

Refer to figure 4-3 for Test Set switch, indicator, and test point locations.

(1) Perform Initial Test Setup paragraph 4-3 a.

(2) Set transceiver to VOICE/MCW 243.0 mode. Be sure RADIO SELECT switch is set for PRC-90 (243.0).

(3) Set XMIT TEST REC TEST switch to XMIT TEST.

(4) Plug mounting cradle Audio Coupler Unit into Test Set AUDIO OUTPUT. Remove Audio Coupler Unit from holding clip and place open end squarely over transceiver TALK microphone.

(5) Actuate transceiver PUSH TO TALK button by rotating cam lever on mounting cradle.

(6) Observe all DC Test Module LED indicators. If both BATTERY CURRENT and BATTERY VOLTAGE green PASS indicators are illuminated and SHORT CIRCUIT indicator is not illuminated, proceed to step (7). If red SHORT CIRCUIT indicator is illuminated, reject transceiver for short/over current. If red FAIL indicator for either BATTERY CURRENT or BATTERY VOLTAGE is illuminated, replace battery and recheck. If either red FAIL indicator is still illuminated after replacing battery, reject transceiver for indicated malfunction.

(7) Momentarily depress R.F. POWER PRESS pushbutton. Observe R.F. POWER indicators. If green PASS indicator is illuminated proceed to step (8). Reject transceiver if R.F. POWER red FAIL indicator is illuminated.

NOTE

An approximate RF power output reading can be obtained by using a VOM as a dc voltage monitor at R.F. POWER T.P. Record VOM reading with R.F. POWER PRESS pushbutton depressed. Use figure 4-5 to determine the approximate power output based on the dc voltage reading previously recorded.

(8) Depress and hold % MODULATION PRESS pushbutton for three seconds. If after three seconds the % MODULATION green PASS indicator is illuminated, proceed to step (9). Reject transceiver if after the three seconds, the % MODULATION red FAIL indicator is illuminated.

(9) Rotate mounting cradle cam lever to release transceiver PUSH TO TALK button.

(10) Return Audio Coupler Unit to holding clip. Disconnect plug from AUDIO OUTPUT.

(11) Momentarily actuate transceiver MCW button by depressing MCW lever on radio cradle. At the same time, momentarily depress RF Analysis Module AUDIO PRESS pushbutton. If steady tone is heard, proceed to step (12). Reject transceiver if no tone is heard.

(12) Set transceiver to BCN 243 MHz mode.

(13) Momentarily depress AUDIO PRESS pushbutton. If characteristic radio beacon sweep tone is heard, proceed to step (14). Reject transceiver if no tone or a steady tone is heard.

(14) Set transceiver to VOICE/MCW 243.0.

(15) Set XMIT TEST REC TEST switch to REC TEST.

(16) Momentarily depress REC. TEST PRESS pushbutton. If steady tone is heard from transceiver, proceed to step (17). Reject transceiver if no tone is heard.

(17) Unlatch and open Test Chamber cover.

CAUTION

Do not attempt to reset Load Carriage with transceiver antenna in Load Carriage.

(18) Remove transceiver from Test Chamber. Set transceiver to VOICE 282.8 MHz.

(19) Set RADIO SELECT switch to PRC-90 (282.8).

(20) Refer to Table I, located on the inside of the Test Chamber cover for load scale setting information for PRC-90 (282.8).

(21) Loosen load carriage position securing knob. Slide load carriage to set pointer at the guide scale setting for PRC-90 282.8 MHz. Lightly tighten position securing knob to secure load carriage at this setting.

(22) Place transceiver back on mounting cradle and press antenna between load carriage contacts. Be sure antenna is fully extended.

(23) Close and latch Test Chamber cover.

(24) Set XMIT TEST REC TEST switch to XMIT TEST.

(25) Actuate transceiver PUSH TO TALK button by rotating cam lever on mounting cradle.

(26) Observe all DC Test Module indicators. If no red indicators are illuminated, proceed to step (27). Reject transceiver if any DC Test Module red indicator is illuminated.

(27) Plug mounting cradle Audio Coupler Unit into Test Set AUDIO OUTPUT. Remove Audio Coupler Unit from holding clip and place open end squarely over transceiver TALK microphone.

(28) Depress and hold % MODULATION PRESS pushbutton for three seconds. If after three seconds the % MODULATION green PASS indicator is illuminated, proceed to step (29). Reject transceiver if after three seconds, the % MODULATION red FAIL indicator is illuminated.

(29) Momentarily depress R.F. POWER PRESS pushbutton. Observe R.F. POWER indicators. If green PASS indicator is illuminated proceed to step (30). Reject transceiver if R.F. POWER red FAIL indicator is illuminated.

NOTE

An approximate RF power output reading can be obtained by using a VOM as a dc voltage monitor at R.F. POWER T.P. Record VOM reading with R.F. POWER PRESS pushbutton depressed. Use figure 4-5 to determine the approximate power output based on the dc voltage reading previously recorded.

(30) Return Audio Coupler Unit to holding clip. Disconnect plug from AUDIO OUTPUT.

(31) Rotate mounting cradle cam lever to release transceiver PUSH TO TALK button.

(32) Set XMIT TEST REC. TEST switch to REC. TEST.

(33) Momentarily depress REC. TEST PRESS pushbutton. If steady tone is heard from transceiver LISTEN speaker, proceed to step (34). Reject transceiver if no tone is heard.

(34) Remove battery from DC Test Module. Unlatch and open Test Chamber cover.

(35) Remove transceiver from Test Chamber. Set transceiver to OFF. Collapse antenna. Reinstall battery in transceiver.

PRC-90 Transceiver Test complete.

d. AN/PRC-106 Transceiver Test.

NOTE

Refer to figure 4-3 for Test Set switch, indicator, and test point locations.

(1) Perform Initial Test Setup paragraph 4-3 a.

(2) Set transceiver to 121.5. Be sure RADIO SELECT switch is set for PRC-106 (121.5).

(3) Set XMIT TEST REC TEST switch to XMIT TEST.

(4) Actuate transceiver PUSH TO TALK button by rotating cam lever on mounting cradle.

(5) Observe all DC Test Module LED indicators. If both BATTERY CURRENT and BATTERY VOLTAGE green PASS indicators are illuminated and SHORT CIRCUIT indicator is not illuminated, proceed to step (6). If red SHORT CIRCUIT indicator is illuminated, reject transceiver for short/over current. If red FAIL indicator for either BATTERY CURRENT or BATTERY VOLTAGE is illuminated, replace battery and recheck. If

either red FAIL indicator is still illuminated after replacing battery, reject transceiver for indicated malfunction.

(6) Plug mounting cradle Audio Coupler Unit into Test Set AUDIO OUTPUT. Remove Audio Coupler Unit from holding clip and place open end squarely over transceiver TALK microphone.

(7) Momentarily depress R.F. POWER PRESS pushbutton. Observe R.F. POWER indicators. If green PASS indicator is illuminated proceed to step (8). Reject transceiver if R.F. POWER red FAIL indicator is illuminated.

NOTE

An approximate RF power output reading can be obtained by using a VOM as a dc voltage monitor at R.F. POWER T.P. Record VOM reading with R.F. POWER PRESS pushbutton depressed. Use figure 4-5 to determine the approximate power output based on the dc voltage reading previously recorded.

(8) Depress and hold % MODULATION PRESS pushbutton for three seconds. If after three seconds the % MODULATION green PASS indicator is illuminated, proceed to step (9). Reject transceiver if after the three seconds, the % MODULATION red FAIL indicator is illuminated.

(9) Return Audio Coupler Unit to holding clip. Disconnect plug from AUDIO OUTPUT.

(10) Rotate mounting cradle cam lever to release transceiver PUSH TO TALK button.

(11) Momentarily actuate transceiver BEACON START button by depressing MCW lever on radio cradle. At the same time, momentarily depress RF Analysis Module AUDIO PRESS pushbutton. If characteristic radio beacon sweep tone is heard, proceed to step (12). Reject transceiver if no tone or steady tone is heard.

(12) Momentarily depress R.F. POWER PRESS pushbutton. Observe R.F. POWER indicators. If green PASS indicator is illuminated proceed to step (13). Reject transceiver if R.F. POWER red FAIL indicator is illuminated.

NOTE

An approximate RF power output reading can be obtained by using a VOM as a dc voltage monitor at R. F. POWER T.P. Record VOM reading with R.F. POWER PRESS pushbutton depressed. Use figure 4-5 to determine the approximate power output based on the dc voltage reading previously recorded.

(13) Depress and hold % MODULATION PRESS pushbutton for three seconds. If after three seconds the % MODULATION green PASS indicator is illuminated, proceed to step (14). Reject transceiver if after the three seconds, the % MODULATION red FAIL indicator is illuminated.

(14) Momentarily actuate transceiver PUSH TO TALK button, with cam lever on mounting cradle, to release transceiver from beacon mode.

(15) Set XMIT TEST REC TEST switch to REC TEST.

NOTE

Noise may be heard from the transceiver LISTEN speaker prior to next step. This is normal.

(16) Momentarily depress REC. TEST PRESS pushbutton. If steady tone is heard from transceiver, proceed to step (17). Reject transceiver if no tone is heard.

(17) Unlatch and open Test Chamber cover.

CAUTION

Do not attempt to reset Load Carriage with transceiver antenna in Load Carriage.

(18) Remove transceiver from Test Chamber. Set transceiver to 243.

(19) Set RADIO SELECT switch to PRC-106 (243.0 MHz).

(20) Refer to Table I, located on the inside of the Test Chamber cover for load scale setting information for PRC-106 (243.0 MHz).

(21) Loosen load carriage position securing knob. Slide load carriage to set pointer at the guide scale setting for PRC-106 243.0 MHz. Lightly tighten position securing knob to secure load carriage at this setting.

(22) Place transceiver back on mounting cradle and press antenna between load carriage contacts. Be sure antenna is fully extended.

(23) Close and latch Test Chamber cover.

(24) Set XMIT TEST REC TEST switch to XMIT TEST.

(25) Plug mounting cradle Audio Coupler Unit into Test Set AUDIO OUTPUT. Remove Audio Coupler Unit from holding clip and place open end squarely over transceiver TALK microphone.

(26) Actuate transceiver PUSH TO TALK button by rotating cam lever on mounting cradle.

(27) Observe all DC Test Module indicators. If no red indicators are illuminated, proceed to step (28). Reject transceiver if any DC Test Module red indicator is illuminated.

(28) Momentarily depress R.F. POWER PRESS pushbutton. Observe R.F. POWER indicators. If green PASS indicator is illuminated proceed to step (29). Reject transceiver if R.F. POWER red FAIL indicator is illuminated.

NOTE

An approximate RF power output reading can be obtained by using a VOM as a dc voltage monitor at R.F. POWER T.P. Record VOM reading with R.F. POWER PRESS pushbutton depressed. Use figure 4-5 to determine the approximate power output based on the dc voltage reading previously recorded.

(29) Depress and hold % MODULATION PRESS pushbutton for three seconds. If after three seconds the % MODULATION green PASS indicator is

illuminated, proceed to step (30). Reject transceiver if after three seconds, the % MODULATION red FAIL indicator is illuminated.

(30) Return Audio Coupler Unit to holding clip. Disconnect plug from AUDIO OUTPUT.

(31) Momentarily actuate transceiver BEACON START button by depressing MCW lever on radio cradle. At the same time, momentarily depress RF Analysis Module AUDIO PRESS pushbutton. If characteristic radio beacon sweep tone is heard, proceed to step (32). Reject transceiver if no tone or steady tone is heard.

(32) Momentarily depress R.F. POWER PRESS pushbutton. Observe R.F. POWER indicators. If green PASS indicator is illuminated proceed to step (33). Reject transceiver if R.F. POWER red FAIL indicator is illuminated.

NOTE

An approximate RF power output reading can be obtained by using a VOM as a dc voltage monitor at R.F. POWER T.P. Record VOM reading with R.F. POWER PRESS pushbutton depressed. Use figure 4-5 to determine the approximate power output based on the dc voltage reading previously recorded.

(33) Depress and hold % MODULATION PRESS pushbutton for three seconds. If after three seconds the % MODULATION green PASS indicator is illuminated, proceed to step (34). Reject transceiver if after the three seconds, the % MODULATION red FAIL indicator is illuminated.

(34) Rotate mounting cradle cam lever to release transceiver PUSH TO TALK button.

(35) Set XMIT TEST REC. TEST switch to REC. TEST.

(36) Momentarily depress REC. TEST PRESS pushbutton. If steady tone is heard from transceiver LISTEN speaker, proceed to step (37). Reject transceiver if no tone is heard.

(37) Remove battery from DC Test Module. Unlatch and open Test Chamber cover.

(38) Remove transceiver from Test Chamber. Set transceiver to OFF. Collapse antenna. Reinstall battery in transceiver.

PRC-106 Transceiver Test complete.

e. AN/URC-64 Transceiver Test.

NOTE

Refer to figure 4-3 for Test Set switch, indicator, and test point locations.

(1) Perform Initial Test Setup paragraph 4-3 a.

(2) Set transceiver MODE switch to T and CHAN switch to A. Be sure RADIO SELECT switch is set for URC-64 (243.0 MHz).

(3) Set XMIT TEST REC TEST switch to XMIT TEST.

(4) Observe all DC Test Module LED indicators. If both BATTERY CURRENT and BATTERY VOLTAGE green PASS indicators are illuminated and SHORT CIRCUIT indicator is not illuminated, proceed to step (5). If red SHORT CIRCUIT indicator is illuminated, reject transceiver for short/over current. If red FAIL indicator for either BATTERY CURRENT or BATTERY VOLTAGE is illuminated, replace battery and recheck. If either red FAIL indicator is still illuminated after replacing battery, reject transceiver for indicated malfunction.

(5) Momentarily depress R.F. POWER PRESS pushbutton. Observe R.F. POWER indicators. If green PASS indicator is illuminated proceed to step (6). Reject transceiver if R.F. POWER red FAIL indicator is illuminated.

NOTE

An approximate RF power output reading can be obtained by using a VOM as a dc voltage monitor at R.F. POWER T.P. Record VOM reading with R.F. POWER PRESS pushbutton depressed. Use figure 4-5 to determine the approximate power output based on the dc voltage reading previously recorded.

(6) Depress and hold % MODULATION PRESS pushbutton for three seconds. If after three seconds the % MODULATION green PASS indicator is illuminated, proceed to step (7). Reject transceiver if after three seconds, the % MODULATION red FAIL indicator is illuminated.

(7) Momentarily depress AUDIO PRESS pushbutton. If characteristic radio beacon sweep tone is heard, proceed to step (8). Reject transceiver if no tone or a steady tone is heard.

(8) Set transceiver MODE switch to V.

(9) Plug mounting cradle Audio Coupler Unit into Test Set AUDIO OUTPUT. Remove Audio Coupler Unit from holding clip and place open end squarely over transceiver TALK microphone.

(10) Actuate transceiver PUSH-TO-TALK button by rotating cam lever on mounting cradle.

(11) Depress and hold % MODULATION PRESS pushbutton for three seconds. If after three seconds the % MODULATION green PASS indicator is illuminated, proceed to step (12). Reject transceiver if after three seconds, the % MODULATION red FAIL indicator is illuminated.

(12) Momentarily depress R.F. POWER PRESS pushbutton. Observe R.F. POWER indicators. If green PASS indicator is illuminated proceed to step (13). Reject transceiver if R.F. POWER red FAIL indicator is illuminated.

NOTE

An approximate RF power output reading can be obtained by using a VOM as a dc voltage monitor at R.F. POWER T.P. Record VOM reading with R.F. POWER PRESS pushbutton depressed. Use figure 4-5 to determine the approximate power output based on the dc voltage reading previously recorded.

(13) Return Audio Coupler Unit to holding clip. Disconnect plug from AUDIO OUTPUT.

(14) Rotate mounting cradle cam lever to release transceiver PUSH TO TALK button.

(15) Set XMIT TEST REC TEST switch to REC TEST.

(16) Momentarily depress REC. TEST PRESS pushbutton. If steady tone is heard from transceiver, proceed to step (17). Reject transceiver if no tone is heard.

(17) Unlatch and open Test Chamber cover.

CAUTION

Do not attempt to reset Load Carriage with transceiver antenna in Load Carriage.

(18) Remove transceiver from Test Chamber. Check that transceiver MODE switch is set to V. Set CHAN switch to B.

(19) Set RADIO SELECT switch to URC-64 (247.3MHz).

(20) Refer to Table I, located on the inside of the Test Chamber cover for load scale setting information for URC-64 (247.3 MHz).

(21) Loosen load carriage position securing knob. Slide load carriage to set pointer at the guide scale setting for URC-64 (247.3 MHz). Lightly tighten position securing knob to secure load carriage at this setting.

(22) Place transceiver back on mounting cradle and press antenna between load carriage contacts. Be sure antenna is fully extended.

(23) Close and latch Test Chamber cover.

(24) Set XMIT TEST REC TEST switch to XMIT TEST.

(25) Plug mounting cradle Audio Coupler Unit into Test Set AUDIO OUTPUT. Remove Audio Coupler Unit from holding clip and place open end squarely over transceiver speaker.

(26) Actuate transceiver PUSH-TO-TALK button by rotating cam lever on mounting cradle.

(27) Observe all DC Test Module indicators. If no red indicators are illuminated, proceed to step (28). Reject transceiver if any DC Test Module red indicator is illuminated.

(28) Momentarily depress R.F. POWER PRESS pushbutton. Observe R.F. POWER indicators. If green PASS indicator is illuminated proceed to step (29). Reject transceiver if R.F. POWER red FAIL indicator is illuminated.

NOTE

An approximate RF power output reading can be obtained by using a VOM as a dc voltage monitor at R.F. POWER T.P. Record VOM reading with R.F. POWER PRESS pushbutton depressed. Use figure 4-5 to determine the approximate power output based on the dc voltage reading previously recorded.

(29) Depress and hold % MODULATION PRESS pushbutton for three seconds. If after three seconds the % MODULATION green PASS indicator is illuminated, proceed to step (30). Reject transceiver if after three seconds, the % MODULATION red FAIL indicator is illuminated.

(30) Return Audio Coupler Unit to holding clip. Disconnect plug from AUDIO OUTPUT.

(31) Rotate mounting cradle cam lever to release transceiver PUSH TO TALK button.

(32) Set XMIT TEST REC TEST switch to REC TEST.

(33) Momentarily depress REC. TEST PRESS pushbutton. If steady tone is heard from transceiver SPKR-MIKE, proceed to step (52). Reject transceiver if not tone is heard.

(34) Set XMIT TEST REC TEST switch to XMIT TEST.

(35) Set transceiver MODE switch to T.

(36) Momentarily depress R.F. POWER PRESS pushbutton. Observe R.F. POWER indication. If green PASS indicator is illuminated, proceed to step (37). Reject radio if R.F. POWER red FAIL indicator is illuminated.

NOTE

An approximate RF power output reading can be obtained by using a VOM as a dc voltage monitor at RF POWER T.P. Record VOM reading with R.F. POWER PRESS pushbutton depressed. Use figure 4-5 to determine the approximate power output based on the dc voltage reading previously recorded.

(37) Momentarily depress AUDIO PRESS pushbutton. If characteristic radio beacon sweep tone is heard, proceed to step (38). Reject radio if no tone or a steady tone is heard.

(38) Depress and hold % MODULATION PRESS pushbutton for three seconds. If after three seconds the % MODULATION green PASS indicator is illuminated, proceed to step (39). Reject transceiver if after three seconds, the % MODULATION red FAIL indicator is illuminated.

(39) Unlatch and open Test Chamber cover.

CAUTION

Do not attempt to reset Load Carriage with transceiver antenna in Load Carriage.

(40) Remove transceiver from Test Chamber. Be sure that transceiver MODE switch is set to T. Set CHAN switch to C.

(41) Set RADIO SELECT switch to URC-64 (248.2 MHz).

(42) Refer to Table I, located on the inside of the Test Chamber cover for load scale setting information for URC-64 (248.2 MHz).

(43) Loosen load carriage position securing knob. Slide load carriage to set pointer at the guide scale setting for URC-64 (248.2 MHz). Lightly tighten position securing knob to secure load carriage at this setting.

(44) Place transceiver back on mounting cradle and press antenna between load carriage contacts. Be sure antenna is fully extended.

(45) Close and latch Test Chamber cover.

(46) Observe all DC Test Module indicators. If no red indicators are illuminated, proceed to step (47). Reject transceiver if any DC Test Module red inciator is illuminated.

(47) Depress and hold % MODULATION PRESS pushbutton for three seconds. If after three seconds the % MODULATION greeen PASS indicator is illuminated, proceed to step (48). Reject transceiver if after three seconds the % MODULATION red FAIL indicator is illuminated.

(48) Momentarily depress R.F. POWER PRESS pushbutton. Observe R.F. POWER indicators. If green PASS indicator is illuminated proceed to step (49). Reject transceiver if R.F. POWER red FAIL indicator is illuminate

NOTE

An approximate RF power output reading can be obtained by using a VOM as a dc voltage monitor at R.F. POWER T.P. Record VOM reading with R.F. POWER PRESS pushbutton depressed. Use figure 4-5 to determine the approximate power output based on the dc voltage reading previously recorded.

(49) Momentarily depress AUDIO PRESS pushbutton. If characteristic radio beacon sweep tone is heard, proceed to step (50). Reject radio if no tone or a steady tone is heard.

(50) Set transceiver MODE switch to V.

(51) Remove Audio Coupler Unit from holding clip and place open end squarely over transceiver speaker.

(52) Actuate transceiver PUSH-TO-TALK button by rotating cam lever on mounting cradle.

(53) Momentarily depress R.F. POWER PRESS pushbutton. Observe R.F. POWER indication. If green PASS indicator is illuminated, proceed to step (54). Reject radio if R.F. POWER red FAIL indicator is illuminated.

NOTE

An approximate RF power output reading can be obtained by using a VOM as a dc voltage monitor at RF POWER T.P. Record VOM reading with R.F. POWER PRESS pushbutton depressed. Use figure 4-5 to determine the approximate power output based on the dc voltage reading previously recorded.

(54) Depress and hold % MODULATION PRESS pushbutton for three seconds. If after three seconds the % MODULATION green PASS indicator is illuminated, proceed to step (55). Reject transceiver if after three seconds, the % MODULATION red FAIL indicator is illuminated.

(55) Rotate mounting cradle cam lever to release transceiver PUSH-TO-TALK button.

(56) Return Audio Coupler Unit to holding clip. Disconnect plug from AUDIO OUTPUT.

(57) Set XMIT TEST REC TEST switch to REC TEST.

(58) Momentarily depress REC. TEST PRESS pushbutton. If steady tone is heard from transceiver SPKR-MIKE, proceed to step (59). Reject transceiver if no tone is heard.

(59) Unlatch and open Test Chamber cover.

CAUTION

Do not attempt to reset Load Carriage with transceiver antenna in Load Carriage.

(60) Remove transceiver from Test Chamber. Be sure that transceiver MODE switch is set to T. Set CHAN switch to D.

(61) Set RADIO SELECT switch to URC-64 (282.8 MHz).

(62) Refer to Table I, located on the inside of the Test Chamber cover for load scale setting information for URC-64 (282.8 MHz).

(63) Loosen load carriage position securing knob. Slide load carriage to set pointer at the guide scale setting for URC-64 (282.8 MHz). Lightly tighten position securing knob to secure load carriage at this setting.

(64) Place transceiver back on mounting cradle and press antenna between load carriage contacts. Be sure antenna is fully extended.

(65) Close and latch Test Chamber cover.

(66) Set XMIT TEST REC TEST switch to XMIT TEST.

(67) Observe all DC Test Module indicators. If no red indicators are illuminated, proceed to step (68). Reject transceiver if any DC Test Module red indicator is illuminated.

(68) Depress and hold % MODULATION PRESS pushbutton for three seconds. If after three seconds the % MODULATION green PASS indicator is illuminated, proceed to step (69). Reject transceiver if after three seconds, the % MODULATION red FAIL indicator is illuminated.

(69) Momentarily depress R.F. POWER PRESS pushbutton. Observe R.F. POWER indication. If green PASS indicator is illuminated, proceed to step (70). Reject radio if R.F. POWER red FAIL indicator is illuminated.

NOTE

An approximate RF power output reading can be obtained by using a VOM as a dc voltage monitor at RF POWER T.P. Record VOM reading with R.F. POWER PRESS pushbutton depressed. Use figure 4-5 to determine the approximate power output based on the dc voltage reading previously recorded.

(70) Momentarily depress AUDIO PRESS pushbutton. If characteristic radio beacon sweep tone is heard, proceed to step (71). Reject radio if no tone or a steady tone is heard.

(71) Set transceiver MODE switch to V.

(72) Plug mounting cradle Audio Coupler Unit into Test Set AUDIO OUTPUT. Remove Audio Coupler Unit from holding clip and place open end squarely over transceiver speaker.

(73) Actuate transceiver PUSH-TO-TALK button by rotating cam lever on mounting cradle.

(74) Momentarily depress R.F. POWER PRESS pushbutton. Observe R.F. POWER indication. If green PASS indicator is illuminated, proceed to step (75). Reject radio if R.F. POWER red FAIL indicator is illuminated.

NOTE

An approximate RF power output reading can be obtained by using a VOM as a dc voltage monitor at RF POWER T.P. Record VOM reading with R.F. POWER PRESS pushbutton depressed. Use figure 4-5 to determine the approximate power output based on the dc voltage reading previously recorded.

(75) Depress and hold % MODULATION PRESS pushbutton for three seconds. If after three seconds the % MODULATION green PASS indicator is illuminated, proceed to step (76). Reject transceiver if after three seconds, the % MODULATION red FAIL indicator is illuminated.

(76) Rotate mounting cradle cam lever to release transceiver PUSH-TO-TALK button.

(77) Return Audio Coupler Unit to holding clip. Disconnect plug from AUDIO OUTPUT.

(78) Set XMIT TEST REC TEST switch to REC TEST.

(79) Momentarily depress REC. TEST PRESS pushbutton. If steady tone is heard from transceiver SPKR-MIKE, proceed to step (80). Reject transceiver if no tone is heard.

(80) Remove battery from DC Test Module. Unlatch and open Test Chamber cover. Remove transceiver from Test Chamber. Reinstall battery in transceiver.

UCR-64 Transceiver Test complete.

Section V. MAINTENANCE INSTRUCTIONS

5-1. GENERAL. This section provides operational checkout, test and troubleshooting procedures, routine maintenance, and calibration procedure. The operational checkout shall be performed after any and all maintenance accomplished on the ACR/TS-24(B).

NOTE

Make all RF connections with RG58/u coaxial leads.

5-2. INSPECTION AND PREVENTIVE MAINTENANCE. Table 5-1 provides the inspection and preventive maintenance requirements for the ACR/TS-24(B).

Table 5-1. Inspection and Preventive Maintenance Schedule

INTERVAL	ITEM	PROCEDURE
Monthly	RF Module battery	Paragraph 5-3 steps 27, 28 and 29.
Annually	DC Module calibration	Paragraph 5-6 a.
	RF Module calibration	Paragraph 5-6 b.
	RF Module battery	Replace

5-3. OPERATIONAL CHECKOUT. The following procedures will establish the operational readiness of the ACR/TS-24(B) Radio Test Set. Successful completion of this checkout indicates the Test Set is operationally ready for use. Proper test set calibration is essential to completion of this checkout. If a checkout procedure failure can be caused by improper calibration, paragraph 5-6 CALIBRATION will be referenced within that procedure.

If calibration cannot be accomplished or if after calibration the failure still occurs refer to paragraph 5-4 TROUBLESHOOTING. If the Test Set fails any other portion of this checkout, also refer to paragraph 5-4 TROUBLESHOOTING. An external, regulated DC power supply is required for this checkout.

CAUTION

During the following checkout, be sure that polarities are correct in all external power connections to the Test Set.

NOTE

Only the Test Set Battery Adapter Modules and Calibration Plugs are necessary for the checkout procedure. No radios are necessary.

NOTE

All external power voltages shall be measured at external power test points.

(1) Close and latch Test Chamber cover.

(2) Connect external power supply to EXT. PWR. URT-33 test points.

(3) Connect Battery Adapter Module 24-BAM/URT-33 to connector 2J1. para. 5-6 or 5-4 as necessary.

(4) Set external power supply for 7.1 VDC ± .02 VDC. Check that BATTERY VOLTAGE PASS indicator is illuminated and FAIL is off. If not, refer to para. 5-6 a. (1) and 5-4 as necessary.

(5) Set external power supply for 6.9 VDC ± .02 VDC. Check that BATTERY VOLTAGE FAIL indicator is illuminated and PASS is off. If not, refer to para. 5-6 a. (1) or 5-4 as necessary.

(6) Connect Calibration Plug 24-CP/URT-33 to connector 2J1.

(7) Connect digital voltmeter (DVM) to CURRENT T.P.

(8) Set external power supply for a DVM indication of .135 VDC ± .002 VDC. Check that BATTERY CURRENT FAIL indicator is illuminated and PASS is off. If not, refer to para. 5-6 a. (2) or 5-4 as necessary.

(9) Set external power supply for a DVM indication of .115 VDC ± .002 VDC. Check that BATTERY CURRENT PASS indicator is illuminated and FAIL is off. If not, refer to para. 5-6 a. (2) or 5-4 as necessary.

(10) Connect Battery Adapter Module 24-BAM/PRC-90 to connector 2J1.

(11) Connect external power supply to EXT. PWR. PRC-90 test points.

(12) Set external power supply for 10.9 VDC ± .02 VDC. Check that BATTERY VOLTAGE PASS indicator is illuminated and FAIL is off. If not, refer to para. 5-6 a. (1) and 5-4 as necessary.

(13) Set external power supply for 10.7 VDC ± .02 VDC. Check that BATTERY VOLTAGE FAIL indicator is illuminated and PASS is off. If not, refer to para 5-6 a. (1) or 5-4 as necessary.

(14) Connect Calibration Plug 24-CP/PRC-90 to connector 2J1.

(15) Set external power supply for a DVM indication of .160 VDC ± .002 VDC. Check that BATTERY CURRENT FAIL indicator is illuminated and PASS is off. If not, refer to para. 5-6 a. (2) or 5-4 as necessary.

(16) Set external power supply for a DVM indication of .140 VDC ± .002 VDC. Check that BATTERY CURRENT PASS indicator is illuminated and FAIL is off. If not, refer to para 5-6 a. (2) or 5-4 as necessary.

(17) Connect Battery Adapter Module 24-BAM/URC-64 to connector 2J1.

(18) Connect external power supply to EXT. PWR. URC-64 test points.

(19) Set external power supply for 10.9 VDC ± .02 VDC. Check that BATTERY VOLTAGE PASS indicator is illuminated and FAIL is off. If not, refer to para. 5-6 a. (1) and 5-4 as necessary.

(20) Set external power supply for 10.7 VDC ± .02 VDC. Check that BATTERY VOLTAGE FAIL indicator is illuminated and PASS is off. If not, refer to para. 5-6 a. (1) or 5-4 as necessary.

(21) Connect Calibration Plug 24-CP/URC-64 to connector 2J1.

(22) Set external power supply for a DVM indication of .190 VDC ± .002 VDC. Check that BATTERY CURRENT FAIL indicator is illuminated and PASS is off. If not, refer to para. 5-6 a. (2) or 5-4 as necessary.

(23) Set external power supply for a DVM indication of .170 VDC ± .002 VDC. Check that BATTERY CURRENT PASS indicator is illuminated and FAIL is off. If not, refer to para. 5-6 a. (2) or 5-4 as necessary.

(24) Connect a jumper across the resistor of the calibration plug. Check that red SHORT CIRCUIT indicator is illuminated. If not, refer to para. 5-4.

(25) Check that DVM indicates between 250 mV and 400 mV. If not, refer to para. 5-4.

(26) Disconnect all external power connections.

(27) Remove RF Module TEST SET BATTERY. Place Test Set battery into DC Module PRC-90/106 Battery Well.

(28) Connect Battery Adapter Module 24-BAM/PRC-90 to connector 2J1.

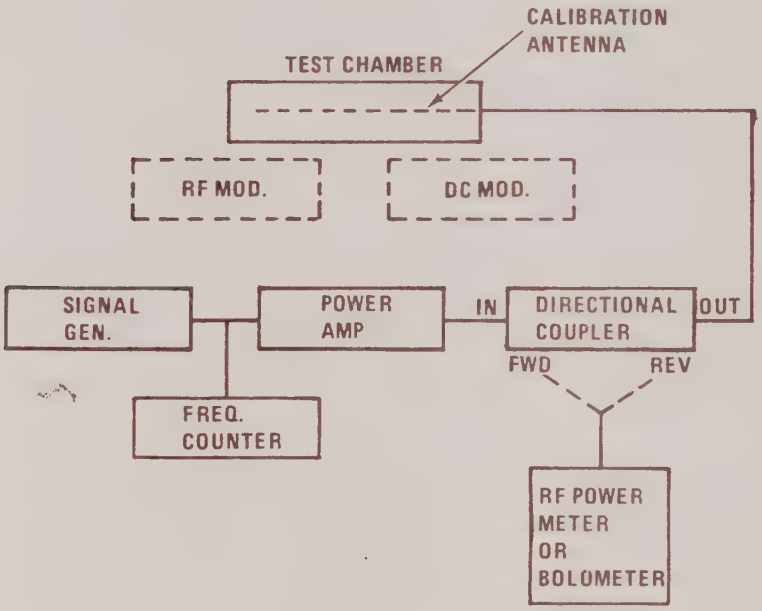
(29) Check BATTERY VOLTAGE FAIL PASS indicators. If red FAIL indicator is illuminated, replace Test Set battery. If green PASS indicator is illuminated, reinstall battery in RF Module TEST SET BATTERY location.

NOTE

RF Module Battery shall be replace on a yearly basis regardless of test results.

(30) Unlatch and open Test Chamber cover. Install 243 MHz Calibration Antenna P/N A3-01-0299 between load carriage contacts. Move load carriage fully toward antenna base. Close and latch Test Chamber cover.

(31) Perform test setup shown in figure 5-1.



NOTE

Make all RF connections with RG58/U coaxial leads.

Figure 5-1. RF Module Test Setup

(32) Connect external regulated DC power supply to RF Module 13.5 VDC EXT. PWR. TEST SET test points. Set external power supply for 13.0 VDC ± .5 VDC.

(33) Disconnect antenna and connect a 50 ohm dummy load to directional coupler output.

(34) Connect power meter to directional coupler forward port.

(35) Set signal generator for 243.0 MHz. Set power amp for power meter indication of 5 mW. Check reflected power to insure 5 mW is being applied to dummy load.

(36) Disconnect dummy load. Reconnect calibration antenna. Connect power meter to directional coupler reflected port.

(37) Check reflected power. If more than .12 mW, disconnect antenna, unlatch and open Test Chamber cover and move load carriage approximately 1/8 inch away from antenna base. Close and latch Test Chamber cover and reconnect calibration antenna. Repeat step (37). moving load carriage in 1/8 inch increments until reflected power is less than .12 mW.

(38) Set RADIO SELECT switch to URT-33B.

(39) Connect power meter to directional coupler forward port.

(40) Set power amp for power meter indication of 2.2 mW ± .05 mW. Green R.F. POWER PASS indicator is to be illuminated and FAIL is off. If not, refer to para. 5-6 b. (1) or 5-4 as necessary.

(41) Set power amp for power meter indication of 1.8 mW ± .05 mW. Red R.F. POWER FAIL indicator is to be illuminated and PASS is off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(42) Set RADIO SELECT switch to URT-33A/C/CM.

(43) Set power amp for power meter indication of 2.2 mW ± .05 mW. Green R.F. POWER PASS indicator is to be illuminated and FAIL is off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(44) Set power amp for power meter indication of 1.8 mW ± .05 mW. Red R.F. POWER FAIL indicator is to be illuminated and PASS is off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(45) Set RADIO SELECT switch to URC-64 (243.0).

(46) Set power amp for power meter indication of 2.2 mW ± .05 mW. Green R.F. POWER PASS indicator is to be illuminated and FAIL is off. If not refer to para. 5-6 b. (1) and 5-4 as necessary.

(47) Set power amp for power meter indication of 1.8 mW ± .05 mW. Red R.F. POWER FAIL indicator is to be illuminated and PASS is off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(48) Install 3 dB attenuator in-line at base of calibration antenna.

(49) Set RADIO SELECT switch to PRC-90 (243.0 MHz).

(50) Set power amp for power meter indication of 1.80 mW ± .03 mW. Green R.F. POWER PASS indicator is to be illuminated and FAIL is off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(51) Set power amp for power meter indication of 1.50 mW ± .03 mW. Red R.F. POWER FAIL indicator is to be illuminated and PASS is off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(52) Set RADIO SELECT switch to PRC-106 (243.0).

(53) Set power amp for power meter indication of 1.80 mW ± .03 mW. Green R.F POWER PASS indicator is to be illuminated and FAIL is off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(54) Set power amp for power meter indication of 1.50 mW ± .03 mW. Red R.F. POWER FAIL indicator is to be illuminated and PASS is off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(55) Remove 3 dB attenuator from calibration antenna. Reconnect directional coupler output directly to calibration antenna.

(56) Set signal generator for 247.3 MHz. Check reflected power. If more than .12 mW, disconnect antenna, unlatch and open Test Chamber cover and move load carriage approximately 1/8 inch away from antenna base. Close and latch Test Chamber cover and reconnect calibration antenna. Repeat step (53) moving load carriage as necessary until reflected power is less than .12 mW.

(57) Connect power meter to directional coupler forward port.

(58) Set RADIO SELECT switch to URC-64 (247.3 MHz).

(59) Set power amp for power meter indication of 2.2 mW $\pm$ .05 mW. Green R.F. POWER PASS indicator is to be illuminated and FAIL is off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(60) Set power amp for power meter indication of 1.8 mW $\pm$ .05 mW. Red R.F. POWER FAIL indicator is to be illuminated and PASS is off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(61) Set signal generator for 248.2 MHz. Check reflected power. If more than .12 mW, disconnect antenna, unlatch and open Test Chamber cover and move load carriage approximately 1/8 inch away from antenna base. Close and latch Test Chamber cover and reconnect calibration antenna. Repeat step (54) moving load carriage as necessary until reflected power is less than .12 mW.

(62) Connect power meter to directional coupler forward port.

(63) Set RADIO SELECT switch to URC-64 (248.2).

(64) Set power amp for power meter indication of 2.2 mW $\pm$ .05 mW. Green R.F. POWER PASS indicator is to be illuminated and FAIL is off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(65) Set power amp for power meter indication of 1.8 mW $\pm$ .05 mW. Red R.F. POWER FAIL indicator is to be illuminated and PASS is off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(66) Disconnect antenna. Unlatch and open Test Chamber cover. Remove 243 MHz Calibration Antenna P/N A3-01-0299.

(67) Install 121.5 MHz Calibration Antenna P/N A3-01-0298 between load carriage contacts. Move load carriage fully toward antenna base. Close and latch Test Chamber cover.

(68) Connect calibration antenna to directional coupler output.

(69) Set signal generator for 121.5 MHz. Check reflected power. If more than .12 mW disconnect antenna, unlatch and open Test Chamber cover and move load carriage approximately 1/8 inch away from antenna base. Close and latch Test Chamber cover and reconnect calibration antenna. Repeat step (66) moving load carriage as necessary until reflected power is less than .12 mW.

(70) Install 3 dB attenuator in-line at base of calibration antenna.

(71) Set RADIO SELECT switch to PRC-106 (121.5).

(72) Set power amp for power meter indication of 1.80 mW ± 03 mW. Green R.F. POWER PASS indicator is to be illuminated and FAIL is off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(73) Set power amp for power meter indication of 1.50 mW ± .03 mW. Red R.F. POWER FAIL indicator is to be illuminated and PASS is off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(74) Disconnect antenna. Remove 3 dB attenuator. Unlatch and open Test Chamber cover. Remove 121.5 MHz Calibration Antenna P/N A3-01-0298.

(75) Install 282.8 MHz Calibration Antenna P/N A3-01-0300 between load carriage contacts. Move load carriage fully toward antenna base. Close and latch Test Chamber cover.

(76) Connect calibration antenna to directional coupler output.

(77) Set signal generator for 282.8 MHz. Check reflected power. If more than .12 mW disconnect antenna, unlatch and open Test Chamber cover and move load carriage approximately 1/8 inch away from antenna base. Close and latch Test Chamber cover and reconnect calibration antenna. Repeat step (74) moving load carriage as necessary until reflected power is less than .12 mW.

(78) Set RADIO SELECT switch to URC-64 (282.8).

(79) Set power amp for power meter indication of 2.2 mW $\pm$ .05 mW. Green R.F. POWER PASS indicator is to be illuminated and FAIL is off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(80) Set power amp for power meter indication of 1.8 mW $\pm$ .05 mW. Red R.F. POWER FAIL indicator is to be illuminated and PASS is off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(81) Install 3 dB attenuator in-line at base of calibration antenna.

(82) Set RADIO SELECT switch to PRC-90 (282.8 MHz).

(83) Set power amp for power meter indication of 1.80 mW ± .03 mW. Green R.F. POWER PASS indicator is to be illuminated and FAIL is off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(84) Set power amp for power meter indication of 1.50 mW ± .03 mW. Red R.F. POWER FAIL indicator is to be illuminated and PASS if off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(85) Modulate RF power 80% $\pm$ 5%. Green PASS indicator is to be illuminated and FAIL is off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(86) Decrease modulation to 60% $\pm$ 5%. Red FAIL indicator is to be illuminated and PASS is off. If not, refer to para. 5-6 b. (1) and 5-4 as necessary.

(87) Depress and hold AUDIO PRESS pushbutton. Listen for audible tone from RF Module speaker. If not, refer to para. 5-4.

(88) Disconnect all external power connections.

(89) Disconnect RF Module test setup.

(90) Gain access to RF Oscillator and Module Assembly by removing six screws and lifting Panel Assembly away from Case (ref. para. 5-5 a. (2) and IPB Section VIII).

(91) Remove RF Oscillator cover (ref. para. 5-5 a. (3) and IPB Section VIII).

(92) Perform RF Oscillator test setup shown in figure 5-2.

NOTE

Label and disconnect wire from MOD input before connecting the 1k Ω resistor and + DC power source.

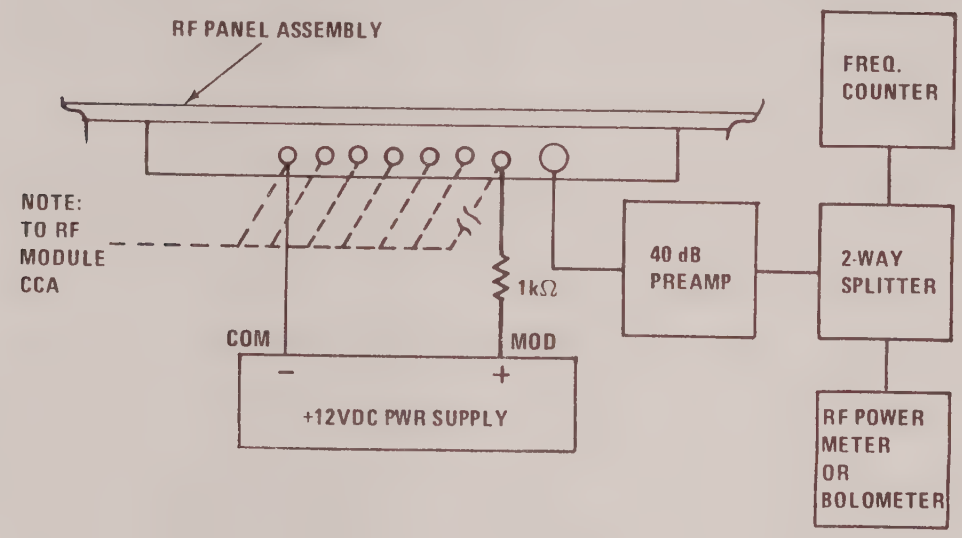


Figure 5-2. RF Oscillator Test Setup

(93) Set RADIO SELECT switch to PRC-106 (121.5 MHz).

(94) Set RADIO SELECT switch to PRC-90 (121.5 MHz).

(95) Depress and hold REC. TEST PRESS pushbutton. Check that frequency counter indicates 121.500 MHz ± 1500 Hz and power meter indicates -3.0 dBm ± 3 dB. If not, refer to para. 5-6 b. (2) and 5-4 as necessary.

(96) Set RADIO SELECT switch to PRC-106 (243.0 MHz).

(97) Depress and hold REC. TEST PRESS pushbutton. Check that frequency counter indicates 243.000 MHz ± 3000 Hz and power meter indicates -3.0 dBm ± 3 dB. If not, refer to para. 5-6 b. (2) and 5-4 as necessary.

(98) Set RADIO SELECT switch to URC-64 (247.3).

(99) Depress and hold REC. TEST PRESS pushbutton. Check that frequency counter indicates 247.300 MHz ± 3000 Hz and power meter indicates -3.0 dBm ± 3 dB. If not, refer to para. 5-6 b. (2) and 5-4 as necessary.

(100) Set RADIO SELECT switch to URC-64 (248.2 MHz).

(101) Depress and hold REC. TEST PRESS pushbutton. Check that frequency counter indicates 248.200 MHz ± 3000 Hz and power meter indicates -3 dBm ± 3 dB. If not, refer to para. 5-6 b. (2) and 5-4 as necessary.

(102) Set RADIO SELECT switch to URC-64 (282.8 MHz).

(103) Depress and hold REC. TEST PRESS pushbutton. Check that frequency counter indicates 282.200 MHz ± 4000 Hz and power meter indicates -3 dBm ± 3 dB. If not, refer to para. 5-6 b. (2) and 5-4 as necessary.

(104) Connect oscilloscope to AUDIO OUTPUT tip jacks located on the right side of the test set.

(105) Depress and hold AUDIO PRESS pushbutton. Check that oscilloscope displays a 1 kHz ± 500 Hz signal and greater than 3 volts peak-to-peak. If not refer to para. 5-4.

(106) Set all external power sources off.

(107) Disconnect test setup. Connect RF coaxial cable to internal 40 dB attenuator. Connect MOD input wiring.

(108) Assemble RF Oscillator (refer. para. 5-5 e. (4) Assemble panel Assembly to RF Module Case. (refer. para. 5-5 e. (3).

Operational checkout and testing complete.

5-4. TROUBLESHOOTING. Table 5-2 provides a troubleshooting guide for general fault isolation. Use of this table along with the operational checkout in paragraph 5-3 provides likely trouble, probably cause, and remedy information. Standard troubleshooting procedures along with use of the test equipment listed in table 2-1 and the schematics provided in Section VI. DIAGRAMS should provide sufficient information to effect repair of the ACR/TS-24(B) Radio Test Set.

Table 5-2. Troubleshooting Guide

TROUBLE	PROBABLE CAUSE	REMEDY
DC Module:		
No indicators light	1. Interlock switch	1. Be sure Test Chamber cover is latched. Check interlock switch and associated wiring.
	2. Radio battery	2. Be sure correct battery is secured in correct battery well.
	3. Incorrect battery adapter module	3. Connect correct battery adapter to connector 2J1.
Some indicators do not illuminate	1. Faulty DC Module CCA	1. Remove and replace DC Module CCA.
Some or all indicators always illuminated	1. Faulty DC Module CCA	1. Remove and replace DC Module CCA.

Table 5-2. Troubleshooting Guide Continued

TROUBLE	PROBABLE CAUSE	REMEDY
All radios fail voltage and/or current tests	1. Faulty DC Module CCA	1. Remove and replace DC Module CCA.
	2. DC Module calibration incorrect	2. Calibrate DC Module
RF Module:		
Little or no audio tone with AUDIO PRESS pushbutton depressed and indicators dim	1. Faulty RF Module Test Set Battery	1. Remove and replace battery.
All radios fail RF POWER	1. REC TEST XMIT TEST switch	1. Check switch position; check switch and associated coaxial cables.
	2. RADIO SELECT switch	2. Check switch position; check switch and associated wiring
	3. Faulty RF Module CCA	3. Remove and replace RF Module CCA.
	4. Load carriage setting incorrect	4. Check load carriage setting, check antenna for good connection to load carriage.
	5. RF Module calibration incorrect	5. Calibrate RF Module

Table 5-2. Troubleshooting Guide Continued

TROUBLE	PROBABLE CAUSE	REMEDY
Indicators do not illuminate with % MODULATION PRESS pushbutton	1. Faulty RF Module Test Set Battery	1. Remove and replace battery.
	2. Faulty RF Module CCA	2. Remove and replace RF Module CCA
All radios fail audio tone with REC. TEST PRESS pushbutton depressed	1. Faulty RF Module Test Set Battery	1. Remove and replace battery
	2. Faulty RF Module CCA	2. Remove and replace RF Module CCA.
	3. Load carriage setting incorrect	3. Check load carriage setting; check antenna for good connection to load carriage.
	4. RADIO SELECT switch	4. Check switch position; check switch and associated wiring.
	5. REC TEST XMIT TEST switch	5. Check switch position; check switch and associated coaxial cables.
	6. Faulty Oscillator and Modulator Assembly	6. Remove and replace Oscillator CCA
	7. Faulty Attenuator Assembly	7. Replace Attenuator Assembly

5-5. REPAIR. The modular concept of the ACR/TS-24(B) enables repair on an assembly/subassembly basis. Upon completion of any repair to the ACR/TS-24(B), alignment and testing shall be performed.

a. Disassembly. Disassembly shall be to the extent necessary to accomplish the repair or replacement of a defective part. Procedures for disassembly are provided in the following paragraphs. For parts location and description, disassembly is referenced to Section VII. Illustrated Parts Breakdown. It is not necessary to follow these procedures in the given paragraph sequence. After removal of major subassemblies refer to the instructions covering the subassembly in which the repair is to be performed.

(1) Test Set Assembly. The RF Analysis Module and the DC Test Module are disassembled from the Test Chamber and Base Plate Assembly by removing their respective mounting screws from the bottom of the Base Plate. Removal of the Test Chamber from the Base Plate also constitutes disassembly of the Test Chamber. Refer to the appropriate disassembly procedure for each of the three major subassemblies.

(2) RF Module Disassembly.

NOTE

The following index numbers refer to IPB figure 1, Sheet 1, except as noted.

(a) Disconnect coaxial cable assembly (12) BNC connector from RF Module (13).

NOTE

RF Module leads to the audio output tip jacks (5 and 6) must be disconnected or the audio output bracket (7) removed before RF Module Assembly (13) is completely freed of Test Chamber and Base Plate Assembly (17).

(b) Remove four screws (14) and remove RF Module Assembly (13) from Test Chamber and Base Plate Assembly (17).

NOTE

The following index numbers refer to IPB figure 2, except as noted.

(c) Remove six screws (2) and lift panel assembly (1) away from Case (22).

(d) Label and disconnect coaxial cables from attenuator (9) and filter (10). Disconnect connectors P4 (item 13 figure 3), P5 (item 19 figure 3) and P6 (20) from RF module CCA (3).

(e) Remove four screws (4) and lock washers (5) and remove RF module CCA (3) from panel assembly (1).

(f) Label and disconnect wiring to battery well assembly (13).

(g) Unscrew cap assembly (12); remove two screws (14), lock washers (15) and nuts (16) and remove battery well assembly (13).

(h) Label and disconnect coaxial cables (item 12, IPB Figure 1, Sheet 1) between switch assembly (7) and RF Module case (22).

(i) Remove screws (8) and remove switch assembly (7).

(j) Remove attenuator (9) by disconnecting from BNC connector (11).

(k) Remove filter (10) by disconnecting from BNC connector (11).

(l) Remove BNC connectors (11), by removing securing nuts on inside of case (22).

(m) Remove eight screws (18) and remove panel mounting bars (17).

(n) Remove cable ties (19) by cutting as necessary.

(o) Label and disconnect wiring from capacitors (21).

(p) Remove capacitors C16 and C17 (21) by removing securing nuts on inside of case (22).

NOTE

The following index numbers refer to IPB figure 3, except as noted.

(q) Remove four hex nuts (2) and remove RF Oscillator and Modulator Assembly (1).

(r) Label and remove wiring from push switches (3). Remove switches by pulling off knobs and removing securing nuts.

(s) Label and remove wiring from tip jacks (4, 5 and 6). Remove tip jacks by removing securing nuts.

(t) Label and remove wiring from rotary switch (12). Remove knob (11) and remove switch (12) by removing securing nut.

(u) Remove screws (8) and remove radio select faceplate (7).

(v) Remove screws (10) and remove calibration cover (9).

(w) Remove screws (15) and remove speaker mounting ring (14), grill (16), speaker assembly (17) and gasket(18).

(3) RF Oscillator and Modulator Assembly.

NOTE

The following index numbers refer to IPB figure 4.

(a) Remove cover from case (12).

(b) Disconnect connector (6) from RF oscillator CCA (10). Remove screws (11) and remove RF Oscillator CCA (10).

(c) Remove screws (8) and (9) and remove attenuator assembly (7).

(d) Label and disconnect wiring from capacitors (1). Remove capacitors by removing securing nuts.

(e) Remove terminal lugs (2) by removing screws (3), lock washers (4) and nuts (5).

(4) DC Module Assembly.

NOTE

The following index numbers refer to IPB figure 1, Sheet 1.

NOTE

DC Module leads to the interlock switch (2) must be disconnected or the interlock switch (2) removed from the Test Chamber and Baseplate Assembly (17) before the DC Module (15) is completely freed of Test Chamber and Baseplate Assembly (17).

(a) Remove four screws (16) and remove DC Module Assembly (15) from Test Chamber and Baseplate Assembly (17).

NOTE

The following index numbers refer to IPB figure 7, except as noted.

(b) Remove six screws (2) and lift panel assembly (1) from case (25).

(c) Disconnect connector P3 (24) and connector P2 (21, IPB Figure 8) from DC Module CCA (3).

(d) Remove screws (4) and lock washers (5)and remove DC Module CCA (3) from panel assembly (1).

(e) Remove connector J1 (6) by removing screws (7), lock washers (8) and nuts (9).

(f) Remove battery retainer assembly (10) by removing thumb screws (11).

(g) Label and disconnect wiring to battery well assembly (12).

(h) Remove screws (13), lock washers (14), nuts (15) and battery well assembly (12) and battery retainer assembly chain (10).

(i) Label and disconnect wiring to battery well assembly (17).

(j) Unscrew cap assembly (16); remove two screws(18), lock washers (19), and nuts (20) and remove battery well assembly (17).

(k) Remove screws (22) and remove panel mounting bars (21).

(l) Label and remove leads from capacitors (23).

(m) Remove capacitors (23) by removing securing nuts on inside of case (25).

NOTE

The following index numbers refer to IPB figure 8.

(n) Remove screws (2) and remove calibration cover (1).

(o) Label and disconnect wiring to backplate assembly (3).

(p) Remove screws (4) and remove backplate assembly (3).

(q) Label and disconnect wiring to tip jacks (5, 6, and 7). Remove tip jacks by removing securing nuts.

(r) Label and disconnect wiring to battery well assembly (14).

(s) Remove nuts (8) and lock washers (9) and remove battery well assembly (14).

(t) Remove screws (11), lock washers (12) and nuts (13) and remove battery well bracket (10).

(5) Test Chamber and Baseplate Assembly.

NOTE

The following index numbers refer to IPB figure 10 except as noted.

(a) Remove four screws (3), seven screws (2) and 11 bumpers (1).

(b) Remove screw (5).

(c) Remove screws (4) and hinge (6) with lid (17).

(d) Remove nuts (7) and hinge (6).

(e) Remove screws (11) and keepers (10).

(f) Remove screws (13) and bracket (12).

(g) Remove nut (9) and chain (8).

(h) Remove nuts (15), retainer (14) and gaskets (16).

(i) Remove screws (29), latches (28) and shims (30).

(j) Remove radio cradle mounting buttons (31).

(k) Disconnect cable assembly (23) BNC connector from load carriage BNC connector (1, figure 11).

(l) Remove three screws (25) to remove load carriage assembly (24) from slide carriage (26).

NOTE

In the following step, screws (19 and 21) serve the dual purpose of securing rails (18 and 20) to channel and end plate assembly (32) and securing the Test Chamber to the Baseplate.

(m) Remove screws (19 and 21) and separate engraved rail (18), cable carrying rail (20), cable assembly (23), slide carriage (26), end plate assembly (32) and baseplate (33).

(n) Unscrew knob (22) and remove contact foot (27) from slide carriage (26).

NOTE

The following index numbers refer to IPB figure 11.

(o) Remove screws (5 and 6), load carriage left side (4) and load carriage right side (12).

NOTE

Use a heat sink in the following step.

(p) Disconnect contact assembly (7) wires from connection pin (10).

(q) Separate contact assembly (7) from load carriage right side (12).

(r) Remove pins (9) and springs (8).

(s) Remove resistor (11) from connection pin (10) and BNC connector (1).

(t) Separate ground plate (2) from load carriage right side (12).

(u) Remove BNC connector (1) from ground plate (2) by removing securing nut.

(v) Pull connection pin (10) and indicator (3) from load carriage right side (12).

b. Cleaning. Wipe the exterior of the Test Set with a clean, lint-free cloth dampened lightly with water. If dirt is hard to remove, a mild soap may be used. The inside surfaces of the Test Chamber shall be cleaned with a clean, lint-free cloth dampened lightly with isopropyl or denatured alcohol. Keep the interior of the Test Chamber free of any foreign materials.

CAUTION

Do not use Test Chamber as storage for any items.

Remove any foreign matter from the interior of any of the modules using a clean soft-bristled brush and/or clean, dry, compressed air at a pressure of not more than 15 psi. Remove dust or dirt from cable and equipment connectors with a soft brush.

c. Inspection. A routine visual inspection should be performed and the resultant corrective action should be taken as follows:

(1) Inspect chassis for loose or missing mounting hardware, deformation, damaged fasteners, or damaged connectors. Replace all damaged parts.

(2) Inspect connectors for broken parts; check insulation for cracks; and check the pins for damage, misalignment, or bad plating. Carefully realign pins when possible, or, if connectors are otherwise severly damaged, replace connector. Check for loose, or poorly soldered connections to terminals of connectors. Tighten or solder as required.

(3) Inspect wiring of chassis and subassemblies for any signs of physical damage or charring. Any damaged wires must be replaced.

(4) Inspect for leaky, blistered, charred, or cracked capacitors, resistors, or diodes. Check for loose or corroded terminal connections. Oviously damaged components shall be replaced.

(5) Inspect for cold soldered or resin joints. Bad joints can be recognized by a dull, porous appearance. Resolder.

d. Repair or Replacement. The repair or replacement of damaged and defective parts usually involves standard service techniques. Carefully examine the equipment to determine the correct technique required to effect the repair.

(1) General Precautions.

(a) Perform repairs and replace components with power disconnected from the receiver.

(b) Replace connectors, shielded conductors, and twisted pairs ONLY with identical items.

(c) Reference to component side of a printed circuit board means the side on which the majority of components are located; solder side refers to the other side.

(d) When repairing circuits, carefully observe lead dress and component orientation. Keep leads as short as possible and observe correct repair techniques.

(e) Observe cable routing prior to disassembly, to enable a proper reinstallation of cabling during reassembly procedures.

(f) If a component is defective beyond any reasonable doubt, remove and replace it according to the procedures given in paragraphs 2 thru 4 below. If there is some doubt about the condition of a component, or if it is being removed for troubleshooting, remove it according to the procedures in paragraph 5.

(2) Circuit Card Assembly, Two-Lead Component Removal (resistors, Capacitors, Diodes, etc.)

(a) Inspect solder side of component to determine if the leads were bent over prior to soldering. If they were not, proceed with step (b). If they were, melt the solder and remove it with a desoldering tool, then straighten the leads and remove the component.

(b) Heat one lead from component side of board until solder flows and lift one lead from board; repeat for other lead and remove component (note orientation).

(c) Melt solder in each hole and using desoldering suction tool remove solder from each hole.

(d) Dress and form leads of replacement component; insert leads into correct holes.

(e) Solder in place and clip leads on solder side of boards.

(3) Circuit Card Assembly, Multi-Lead Component Removal (IC's etc.)

(a) Remove component by clipping each lead along both sides. Clip off leads as close to component as possible. Discard component.

(b) Heat hole from solder side and remove clipped lead from each hole.

(c) Melt solder in each hole and using a desoldering suction tool remove solder from each hole.

(d) Insert replacement component observing correct orientation.

(e) Solder component in place from solder side of board. Avoid solder runs. No solder is required on contacts where no trace exists.

(4) Replacement of Power Transistors.

(a) Unsolder leads and remove attaching hardware. Remove transistor and hard-coat insulator.

(b) Apply thermal compound to the mounting surface of the transistor insulator and to the mounting surface of the replacement transistor.

(c) Reinstall the transistor insulator and the power transistor using hardware previously removed.

(d) After installing the replacement transistor, but before making any electrical connections, measure the resistance between the case of the transistor and the chassis to ensure that the insulation is effective. The resistance measured should be greater than 10 megohms.

(e) Reconnect leads to transistor and solder in place.

(5) Removal of Components of Doubtful Condition.

(a) To remove components that are not heat-sensitive, melt the solder and remove it with a desoldering tool, then remove the component.

(b) To remove components that are heat-sensitive, such as diodes, transistors, and IC's, clip a heat sink to the lead between the body of the component and the solder joint, melt and remove the solder. Repeat for all leads of the component, then remove the component. Apply heat to the lead for the minimum amount of time necessary to remove the solder. When working with IC's, start at

one corner, then go the lead farthest away, then back to where you started, etc.. (Example: Pins 1, 8, 14, 7...) This is to keep heat buildup to a minimum. Remember that some solid state devices are extremely heat-sensitive, and even though maximum care is exercised during their removal, they may still be destroyed by the removal procedure.

(c) To install a heat-sensitive component, use a heat sink and the sequence outlined above to prevent heat from destroying the component.

e. Assembly. Assembly is necessary only to the extent that diassembly was performed. Procedures for assembly of major modules and assemblies are given in the following paragraphs. If more information is required for parts location or description, refer to Section VII. Illustrated Parts Breakdown. It is not necessary to follow these procedures in the given sequence.

(1) Test Chamber and Baseplate Assembly.

NOTE

The following index numbers refer to IPB figure 11.

(a) Push indicator (3) and connection pin (10) into load carriage right side (12).

(b) Install BNC connector (1) with securing nut onto ground plate (2).

(c) Pair ground plate (2) to load carriage right side (12).

(d) Install resistor (11) into connection pin (10) and center conductor of BNC connector (1).

(e) Install springs (8) and pins (9).

(f) Install contact assembly (7).

NOTE

Use a heat sink in the following step.

(g) Connect contact assembly (7) wires to connection pin (10).

(h) Install load carriage left side (4) to load carriage right side (12) with screws (5 and 6).

NOTE

The following index numbers refer to IPB figure 10 except as noted.

(i) Install contact foot (27) with knob (22) to slide carriage (26).

(j) Install baseplate (33), end plate assembly (32), slide carriage (26), cable assembly, cable carrying rail (20) and engraved rail (18) with screws (19 and 21).

(k) Install load carriage assembly (24) to slide carriage (26) with attaching screws (25).

(l) Connect cable assembly (23) BNC connector to load carriage BNC connector (1, figure 11).

(m) Install radio cradle mounting buttons (31).

(n) Install shims (30) and latches (28) with screws (29).

(o) Install gaskets (16) and retainer (14) with nuts (15).

(p) Install end of chain (8) with nut (9).

(q) Install bracket (12) with screws (13).

(r) Install keepers (10) with screws (11).

(s) Install hinge (6) with nuts (7).

(t) Install lid (17) and hinge (6) with screws (4).

(u) Install screw (5).

(v) Install 11 bumpers (1) with seven screws (2) and four screws (3).

(2) DC Module Assembly.

NOTE

The following index numbers refer to IPB figure 8.

(a) Install battery well bracket (10) with screws (11), lock washers (12) and nuts (13).

(b) Install battery well assembly (14) with lock washers (9) and nuts (8). Reconnect wiring.

(c) Install tip jacks (5, 6 and 7) with securing nut. Reconnect wiring.

(d) Install backplate assembly (3) with screws (4). Reconnect wiring.

(e) Install calibration cover (1) with screws (2).

NOTE

The following index numbers refer to IPB figure 7 except as noted.

(f) Install capacitors (23) with securing nuts. Reconnect wiring.

(g) Install panel mounting bars (21) with screws (22).

(h) Install battery well assembly (17) and cap assembly (16) with screws (18), lock washers (19) and nuts (20).

(i) Install battery well assembly (12) and battery retainer assembly chain (10) with screws (13), lock washer (14) and nuts (15).

(j) Secure battery retainer assembly (10) with thumb screws (11).

(k) Install connector J1 (6) with screws (7), lock washers (8) and nuts (9).

(l) Install DC Module CCA (3) with screws (4) and lock washers (5). Connect connector P3 (24) and connector P2 (21, IPB figure 8) to CCA.

(m) Attach panel assembly (1) to case (25) with six screws (2).

NOTE

The following index numbers refer to IPB figure 1, Sheet 1.

(n) Attach DC Module Assembly (15) to Test Chamber and Baseplate Assembly (17) with four screws (16).

(o) Install interlock switch (2) and bracket (3) with screw (1). Reconnect wiring.

(3) RF Module Assembly.

NOTE

The following index numbers refer to IPB figure 4.

(a) Install terminal lugs (2) with screw (3), lugs (2), lock washer (4) and nut (5).

(b) Install capacitors (1) with securing nuts. Reconnect wiring.

(c) Install attenuator assembly (7) with screws (8) and (9).

(d) Install RF Oscillator CCA (10) with screws (11). Connect connector (6) to CCA.

(e) Install cover on case (12).

NOTE

The following index numbers refer to IPB figure 3.

(f) Install speaker mounting ring (14), grill (16), speaker assembly (17) and gasket (18) with screws (15).

(g) Install calibration cover (9) with screws (10).

(h) Install radio select faceplate (7) with screws (8).

(i) Install rotary switch (12) with securing nut and knob (11). Reconnect wiring.

(j) Install tip jacks (4, 5, and 6) with securing nuts. Reconnect wiring.

(k) Install push switches (3) with securing nuts and press on knobs. Reconnect wiring.

(l) Attach RF Oscillator and Modulator Assembly (1) to RF Panel (20) with nuts (2).

NOTE

The following index numbers refer to IPB figure 2, except as noted.

(m) Install capacitors C16 and C17 (21) with securing nuts on inside of case (22). Reconnect wiring.

(n) Install cable ties (19) as necessary.

(o) Install panel mounting bars (17) with eight screws (18).

(p) Install BNC connectors (11) with securing nuts on inside of case (22).

(q) Install filter (10) by connecting to BNC connector (11).

(r) Install attenuator (9) by connecting to BNC connector (11).

(s) Attach switch assembly (7) to case (22) with screws (8).

(t) Install coaxial cables (12, IPB figure 1, sheet 1) between Switch assembly (7) and RF Module case (22).

(u) Install Battery Well Assembly (13) with screws (14), lock washers (15) and nuts (16). Attach cap assembly (12).

(v) Attach RF Module CCA (3) to RF Module Panel Assembly (1) with four screws (4) and lock washers (5).

(w) Connect connectors P4 (item 13 figure 3) P5 (item 19 figure 3) P6 (20) to RF Module CCA (3).

(x) Connect coaxial cables to attenuator (9) and filter (10) and attach RF Module Panel Assembly (1) to RF Module Case (22) with six screws (2).

NOTE

The following index numbers refer to IPB figure 1, Sheet 1.

(y) Install RF Module Assembly (13) with four screws (14).

(z) Install audio output bracket (7), with screws (4).

(aa) Install coaxial cable assembly (12) between RF Module (13) and Test Chamber (17) by connecting BNC connectors.

f. Alignment. After repair to either the DC Module Assembly or the RF Module assembly, perform their respective calibration procedure in paragraph 5-6h.

g. Testing. Perform the Operational Checkout, paragraph 5-3, for testing after any repair.

5-6. CALIBRATION. As an item of test equipment, the ACR/TS-24(B) Radio Test Set requires scheduled periodic calibration. Calibration is to be performed on the DC Module, the RF Module, and the Audio Coupler on both the 24-RC/PRC-90 and the 24-RC/URC-64 radio cradles. Refer to table 5-1 for calibration intervals. Additionally, if any repair action has been performed to the DC Module Assembly or the RF Module Assembly, the individual calibration procedure must also be performed. If during calibration the required calibration standards cannot be obtained, troubleshoot and repair as necessary. Refer to table 2-1 for recommended test equipment.

a. DC Module Calibration. Calibration of the DC Module includes both voltage and current threshold adjustments. Refer to figure 5-3 for component locations. An external regulated DC power supply is required for calibration.

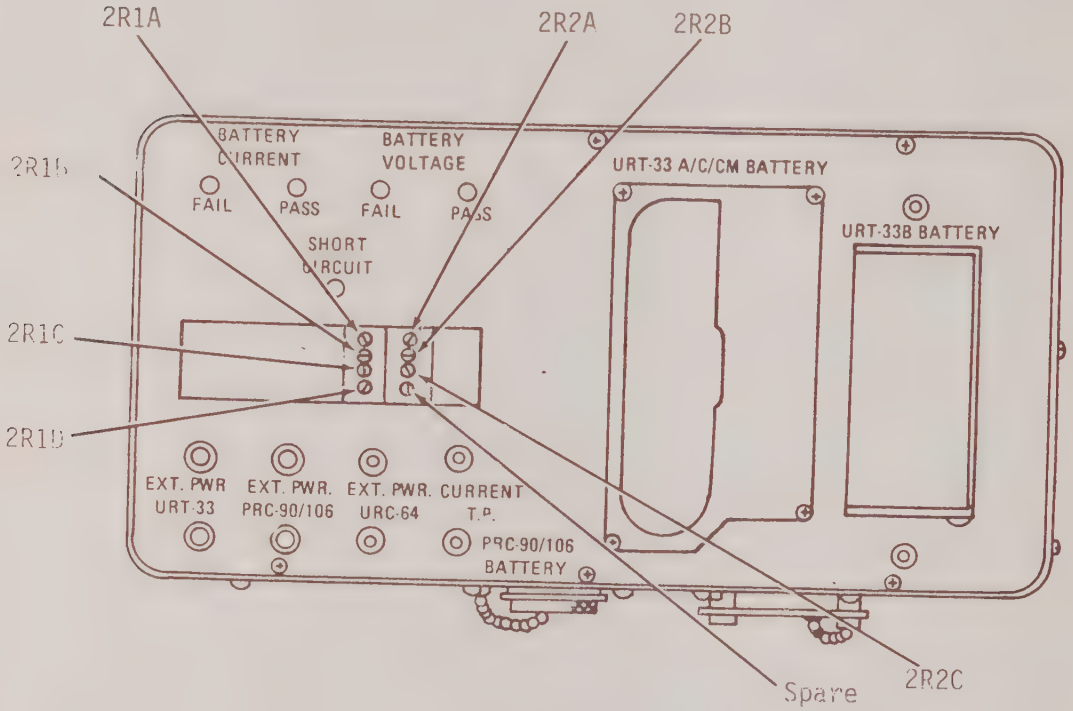


Figure 5-3. DC Module Calibration Component Locator

NOTE

Only test set Battery Adapter Modules and Calibration Plugs are necessary for calibration. No radios are necessary.

(1) DC Module Voltage Adjustments.

CAUTION

Be sure external power to DC Module connections are correct DC polarity.

(a) Close and latch Test Chamber cover. Remove CALIBRATION ADJUSTMENT DC MODULE cover plate.

(b) Connect external power supply to EXT. PWR. URT-33 test points.

(c) Connect Battery Adapter Module 24-BAM/URT-33 to connector 2J1.

(d) Set external power supply for 7.0 VDC ± .02 VDC.

(e) Adjust 2R2A so both the BATTERY VOLTAGE red FAIL and the green PASS indicator flicker randomly.

(f) Set external power supply for 7.1 VDC ± .02 VDC. Green BATTERY VOLTAGE PASS indicator is to be illuminated and FAIL is off. If not, repeat steps (d) thru (f) or troubleshoot as necessary.

(g) Set external power supply for 6.9 VDC ± .02 VDC. Red BATTERY VOLTAGE FAIL indicator is to be illuminated and PASS is off. If not, repeat steps (d) thru (g) or troubleshoot as necessary.

(h) Connect external power supply to EXT. PWR. PRC-90 test points.

(i) Connect Battery Adapter Module 24-BAM/PRC-90 to connector 2J1.

(j) Set external power supply for 10.8 VDC ± .02 VDC.

(k) Adjust 2R2B so both the BATTERY VOLTAGE red FAIL and the green PASS indicator flicker randomly.

(l) Set external power supply for 10.9 VDC ± .02 VDC. Green BATTERY VOLTAGE PASS indicator is to be illuminated and FAIL is off. If not, repeat steps (j) thru (l) or troubleshoot as necessary.

(m) Set external power supply for 10.7 VDC ± .02 VDC. Red BATTERY VOLTAGE FAIL indicator is to be illuminated and PASS is off. If not, repeat steps (j) thru (m) or troubleshoot as necessary.

(n) Connect external power supply to EXT. PWR. URC-64 test points.

(o) Connect Battery Adapter Module 24-BAM/URC-64 to connector 2J1.

(p) Set external power supply for 10.8 VDC ± .02 VDC.

(q) Adjust 2R2C so both the BATTERY VOLTAGE red FAIL and the green PASS indicator flicker randomly.

(r) Set external power supply for 10.9 VDC ± .02 VDC. Green BATTERY VOLTAGE PASS indicator is to be illuminated and FAIL is off. If not, repeat steps (p) thru (r) or troubleshoot as necessary.

(s) Set external power supply for 10.7 VDC ± .02 VDC. Red BATTERY VOLTAGE FAIL indicator is to be illuminated and PASS is off. If not, repeat steps (p) thru (s) or troubleshoot as necessary.

(2) DC Module Current Adjustments.

CAUTION

Be sure external power to DC Module connections are correct DC polarity.

(a) Connect Calibration Plug PN A3-06-0990 to connector 2J1.

(b) Connect external power supply to EXT. PWR. URT-33 test points.

(c) Set external power supply for 12 VDC ± .2 VDC.

NOTE

The DC Module CURRENT T.P. test points provide a voltage output directly proportionate to the current. (e.g. 125 mV = 125 mA).

(d) Connect digital voltmeter (DVM) to CURRENT T.P.

(e) Set external power supply for a DVM indication of .125 VDC ± .002 VDC.

(f) Adjust 2R1A so both the BATTERY CURRENT green FAIL and the red PASS indicator flicker randomly.

(g) Set external power supply for a DVM indicator of .135 VDC ± .002 VDC. Only Red BATTERY CURRENT FAIL indicator is to be illuminated and PASS is off. If not, repeat steps (e) thru (g) or troubleshoot as necessary.

(h) Set external power supply for a DVM indication of .115 VDC ± .002 VDC. Green BATTERY CURRENT PASS indicator is to be illuminated and FAIL is off. If not, repeat steps (e) thru (h) or troubleshoot as necessary.

(i) Set external power supply for 12 VDC ± .2 VDC.

(j) Connect Calibration Plug PN A3-06-0991 to connector 2J1.

(k) Connect external power supply to EXT. PWR. PRC-90 test points.

(l) Set external power supply for a DVM indication of .150 VDC ± .002 VDC.

(m) Adjust 2R1B so both the BATTERY CURRENT red FAIL and the green PASS indicator flicker randomly.

(n) Set external power supply for a DVM indication of .160 VDC ± .002 VDC. Red BATTERY CURRENT FAIL indicator is to be illuminated and PASS is off. If not, repeat steps (l) and (m) or troubleshoot as necessary.

(o) Set external power supply for a DVM indication of .140 VDC ± .002 VDC. Green BATTERY CURRENT PASS indicator is to be illuminated and FAIL is off. If not, repeat steps (l) thru (o) or troubleshoot as necessary.

(p) Set external power supply for 12 VDC ± .2 VDC.

(q) Connect Calibration Plug PN A3-06-0992 to connector 2J1.

(r) Connect external power supply to EXT. PWR. URC-64 test points.

(s) Set external power supply for a DVM indication of .180 VDC. ± .002 VDC.

(t) Adjust 2R1C so both the BATTERY CURRENT red FAIL and the GREEN PASS indicator flicker randomly.

(u) Set external power supply for a DVM indication of .190 VDC ± .002 VDC. Red BATTERY CURRENT FAIL indicator is to be illuminated and PASS is off. If not, repeat steps (s) thru (u) or troubleshoot as necessary.

(v) Set external power supply for a DVM indication of .170 VDC ± .002 VDC. Green BATTERY CURRENT PASS indicator is to be illuminated and FAIL is off. If not, repeat steps (s) thru (v) or troubleshoot as necessary.

(w) Reinstall CALIBRATION ADJUSTMENT DC MODULE cover plate.

DC Module calibration is complete.

b. RF Module Calibration. Calibration of the RF Module includes RF Power and Modulation Percentage Threshold Adjustments and oscillator frequency and amplitude adjustments.

(1) RF Power and Modulation Percentage Threshold Adjustments Refer to figure 5-4 for threshold adjustment locations.

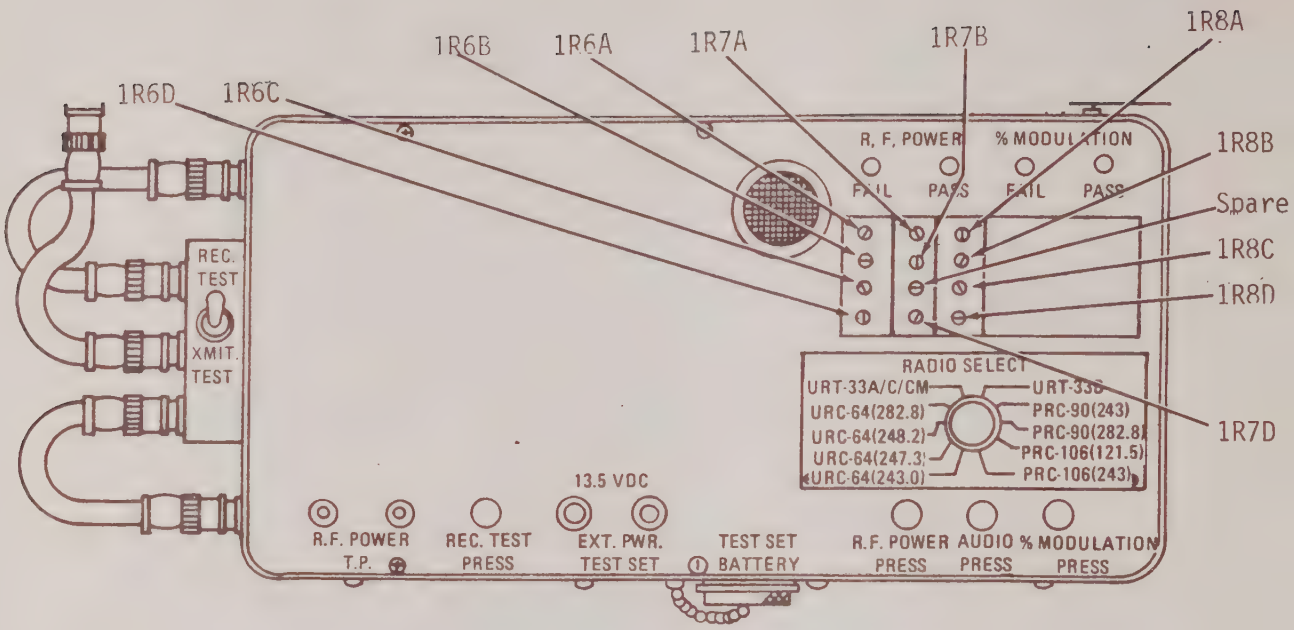
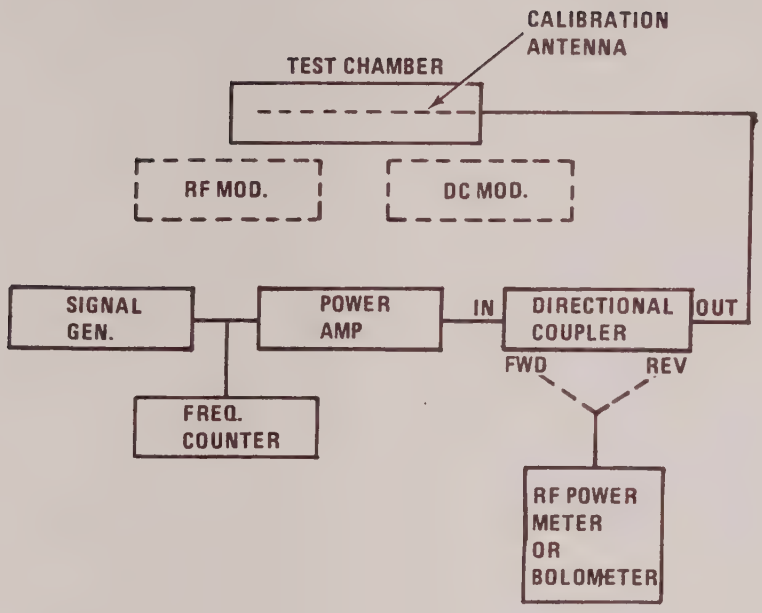


Figure 5-4. RF Power and Modulation Percentage Threshold Adjustment Locator

(a) Remove CALIBRATION ADJUSTMENT R.F. MODULE cover plate.

(b) Unlatch and open Test Chamber cover. Install 243.0 MHz Calibration Antenna PN A3-01-0299 between load carriage contacts. Move load carriage fully toward antenna base. Close and latch Test Chamber cover.

(c) Perform calibration setup shown in figure 5-5.



NOTE

Use RG58/u coax cables for all RF connections.

Figure 5-5. Calibration Setup, RF Module

(d) Connect external regulated DC power supply to R.F. Module 13.5 VDC EXT. PWR. TEST SET test points. Set external power supply for 13.0 VDC ± .5 VDC.

(e) Disconnect antenna and connect a 50 ohm dummy load to directional coupler output.

(f) Connect power meter to directional coupler forward port.

(g) Set signal generator for 243.0 MHz. Set power amp for power meter indication of 5 mW. Check reflected power to insure 5 mW is being applied to dummy load.

(h) Disconnect dummy load. Reconnect calibration antenna. Connect power meter to directional coupler reflected port.

(i) Check reflected power. If more than .12 mW, disconnect antenna, unlatch and open Test Chamber cover and move load carriage approximately 1/8 inch away from antenna base. Close and latch Test Chamber cover and reconnect calibration antenna. Repeat step (i) until reflected power is less than .12 mW.

(j) Set RADIO SELECT switch to URT-33B.

(k) Connect power meter to directional coupler forward port. Set power amp for power meter indication of 2 mW ± .02 mW.

(l) Adjust 1R6A so both the R.F. POWER red FAIL and the green PASS indicator flicker randomly.

(m) Set power amp for power meter indication of 2.2 mW ± .05 mW. Green R.F. POWER PASS indicator is to be illuminated and FAIL is off. If not, repeat steps (k) thru (m) or troubleshoot as necessary.

(n) Set power amp for power meter indication of 1.8 mW ± .05 mW. Red R.F. POWER FAIL indicator is to be illuminated and PASS is off. If not, repeat steps (j) thru (n) or troubleshoot as necessary.

(o) Set RADIO SELECT switch to URT-33 A/C/CM.

(p) Set power amp for power meter indication of 2.0 mW ± .02 mW.

(q) Adjust 1R8B so both the R.F. POWER red FAIL and the green PASS indicator flicker randomly.

(r) Set power amp for power meter indication of 2.2 mW ± .05 mW. Green R.F. POWER PASS indicator is to be illuminated and FAIL is off. If not, repeat steps (p) thru (r) or troubleshoot as necessary.

(s) Set power amp for power meter indication of 1.8 mW ± .05 mW. Red R.F. POWER FAIL indicator is to be illuminated and PASS is off. If not, repeat steps (p) thru (s) or troubleshoot as necessary.

(t) Set RADIO SELECT switch to URC-64 (243.0 MHz).

(u) Set power amp for power meter indication of 2.0 mW ± .02 mW.

(v) Adjust 1R7B so both the R.F. POWER red FAIL and the green PASS indicator flicker randomly.

(w) Set power amp for power meter indication of 2.2 mW ± .05 mW. Green R.F. POWER PASS indicator is to be illuminated and FAIL is off. If not, repeat steps (u) thru (w) or troubleshoot as necessary.

(x) Set power amp for power meter indication of 1.8 mW ± .05 mW. Red R.F. POWER FAIL indicator is to be illuminated and PASS is off. If not, repeat steps (u) thru (x) or troubleshoot as necessary.

(y) Install 3 dB attenuator in-line at base of calibration antenna.

(z) Set RADIO SELECT switch to PRC-90 (243.0 MHz).

(aa) Set power amp for power meter indication of 1.65 mW ± .03 mW.

(ab) Adjust 1R6B so both the R.F. POWER red FAIL and the green PASS indicator flicker randomly.

(ac) Set power amp for power meter indication of 1.80 mW ± .03 mW. Green R.F. POWER PASS indicator is to be illuminated and FAIL is off. If not, repeat steps (aa) thru (ac) or troubleshoot as necessary.

(ad) Set power amp for power meter indication of 1.50 mW ± .03 mW. Red R.F. POWER FAIL indicator is to be illuminated and PASS is off. If not, repeat steps (aa) thru (ad) or troubleshoot as necessary.

(ae) Set RADIO SELECT switch to PRC-106.

(af) Set power amp for power meter indication of 1.65 mW ± .03 mW.

(ag) Adjust 1R7A so both the R.F. POWER red FAIL and the green PASS indicator flicker randomly.

(ah) Set power for power meter indication of 1.80 mW ± .03 mW. Green R.F. POWER PASS indicator is to be illuminated and FAIL is off. If not, repeat steps (af) thru (ah) or troubleshoot as necessary.

(ai) Set power amp for power meter indication of 1.50 mW ± .03 mW. Red R.F. POWER FAIL indicator is to be illuminated and PASS is off. If not repeat steps (af) thru (ai) or troubleshoot as necessary.

(aj) Remove 3 dB attenuator from calibration antenna. Reconnect directional coupler output directly to calibration antenna.

(ak) Set signal generator for 247.3 MHz. Check reflected power. If more than .12 mW, disconnect antenna, unlatch and open Test Chamber cover and move load carriage approximately 1/8 inch away from antenna base. Close and latch Test Chamber cover and reconnect

calibration antenna. Repeat step (36) moving load carriage as necessary until reflected power is less than .12 mW.

(al) Connect power meter to directional coupler forward port. Set power amp for power meter indication of 2 mW $\pm$ .02 mW.

(am) Set RADIO SELECT switch to URC-64 (274.3 MHz).

(an) Adjust 1R7C so both the R.F. POWER red FAIL and the green PASS indicator flicker randomly.

(ao) Set power amp for power meter indication of 2.2 mW $\pm$ .05 mW. Green R.F. POWER PASS indicator is to be illuminated and FAIL is off. If not, repeat steps (al) thru (ao) or troubleshoot as necessary.

(ap) Set power amp for power meter indication of 1.8 mW $\pm$ .05 mW. Red R.F. POWER FAIL indicator is to be illuminated and PASS is off. If not, repeat steps (al) thru (ap) or troubleshoot as necessary.

(aq) Set signal generator for 248.2 MHz. Check reflected power. If more than .12 mW, disconnect antenna, unlatch and open Test Chamber cover and move load carriage approximately 1/8 inch away from antenna base. Close and latch Test Chamber cover and reconnect calibration antenna. Repeat step (aq) moving load carriage as necessary until reflected power is less than .12 mW.

(ar) Connect power meter to directional coupler forward port. Set power amp for power meter indication of 2 mW $\pm$ .02 mW.

(as) Set RADIO SELECT switch to URC-64 (248.2 MHz).

(at) Adjust 1R7D so both the R.F. POWER red FAIL and the green PASS indicator flickers randomly.

(au) Set power amp for power meter indication of 2.2 mW ± .05 mW. Green R.F. POWER PASS indicator is to be illuminated and FAIL is off. If not, repeat steps (ar) thru (au) or troubleshoot as necessary.

(av) Set power amp for power meter indication of 1.8 mW ± .05 mW. Red R.F. POWER FAIL indicator is to be illuminated and PASS is off. If not, repeat steps (ar) thru (av) or troubleshoot as necessary.

(aw) Disconnect antenna. Unlatch and open Test Chamber cover. Remove Calibration Antenna A3-01-0299.

(ax) Install 121.5 MHz Calibration Antenna A3-01-0298 between load carriage contacts. Move load carriage fully toward antenna base. Close and latch Test Chamber cover.

(ay) Connect calibration antenna to directional coupler output.

(az) Set signal generator for 121.5 MHz. Check reflected power. If more than .12 mW disconnect antenna, unlatch and open Test Chamber cover and move load carriage approximately 1/8 inch away from antenna base. Close and latch Test Chamber cover and reconnect calibration antenna. Repeat step (az) moving load carriage as necessary until reflected power is less than .12 mW.

(ba) Install 3 dB attenuator in-line at base of calibration antenna.

(bb) Set RADIO SELECT switch to PRC-106 (121.5 MHz).

(bc) Set power amp for power meter indication of 1.65 mW ± .03 mW.

(bd) Adjust 1R6D so both the R. F. POWER red FAIL and the green PASS indicator flicker randomly.

(be) Set power amp for power meter indication of 1.80 mW ± .03 mW. Green R. F. POWER PASS indicator is to be illuminated and FAIL is off. If not, repeat steps (bc) thru (be) or troubleshoot as necessary.

(bf) Set power amp for power meter indication of 1.50 mW ± .03 mW. Red R. F. POWER FAIL indicator is to be illuminated and PASS is off. If not, repeat steps (bc) thru (bf) or troubleshoot as necessary.

(bg) Disconnect antenna. Remove 3 dB attenuator. Unlatch and open Test Chamber cover. Remove Calibration Antenna A3-01-0298.

(bh) Install 282.8 MHz Calibration Antenna A3-01-0300 between load carriage contacts. Move load carriage fully toward antenna base. Close and latch Test Chamber cover.

(bi) Connect calibration antenna to directional coupler output.

(bj) Set signal generator for 282.8 MHz. Check reflected power. If more than .12 mW disconnect antenna, unlatch and open Test Chamber cover and move load carriage approximately one inch away from antenna base. Close and latch Test Chamber cover and reconnect calibration antenna. Repeat step (bj) moving load carriage as necessary until reflected power is less than .12 mW.

(bk) Set RADIO SELECT switch to URC-64 (282.8 MHz).

(bl) Set power amp for power meter indication of 2.0 mW ± .02 mW.

(bm) Adjust 1R8A so both the R. F. POWER red FAIL and the green PASS indicator flicker randomly.

(bn) Set power amp for power meter indication of 2.2 mW ± .05 mW. Green R. F. POWER PASS indicator is to be illuminated and FAIL is off. If not, repeat steps (bl) thru (bn) or troubleshoot as necessary.

(bo) Set power amp for power meter indication of 1.8 mW ± .05 mW. Red R. F. POWER FAIL indicator is to be illuminated and PASS is off. If not, repeat steps (bl) thru (bo) or troubleshoot as necessary.

(bp) Install 3 dB attenuator in-line at base of calibration antenna.

(bq) Set RADIO SELECT switch to PRC-90 (282.8 MHz).

(br) Set power amp for power meter indication of 1.65 mW ± .03 mW.

(bs) Adjust 1R6C so both the R. F. POWER red FAIL and the green PASS indicator flicker randomly.

(bt) Set power amp for power meter indication of 1.80 mW ± .03 mW. Green R. F. POWER PASS indicator is to be illuminated and FAIL is off. If not, repeat steps (br) thru (bt) or troubleshoot as necessary.

(bu) Set power amp for power meter indication of 1.50 mW ± .03 mW. Red R. F. POWER FAIL indicator is to be illuminated and PASS is off. If not, repeat steps (br) thru (bu) or troubleshoot as necessary.

(bv) Modulate RF power with 1 KHz at 70% ± 2%.

(bw) Adjust 1R8D so both the % MODULATION red FAIL and green PASS indicator flicker randomly.

(bx) Increase modulation to 80% ± 5%. Green PASS indicator is to be illuminated and FAIL is off. If not, repeat steps (bv) thru (bx) or troubleshoot as necessary.

(by) Decrease modulation to 60% ± 5%. Red FAIL indicator is to be illuminated and PASS is off. If not, repeat steps (bv) thru (by) or troubleshoot as necessary.

(bz) Reinstall CALIBRATION ADJUSTMENT R. F. MODULE cover plate.

(ca) Set all external power sources off.

(cb) Disassemble test setup.

(2) RF Oscillator Frequency Adjustments.

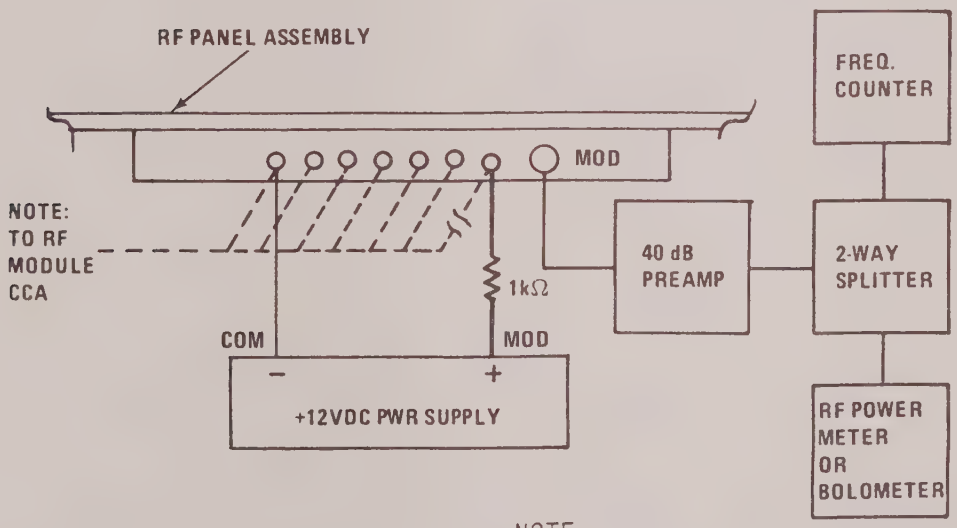
(a) Gain access to RF Oscillator by removing six screws and lifting Panel Assembly away from Case (ref. para. 5-5(2) and IPB Section VII).

(b) Remove RF Oscillator cover (ref. para. 5-5(2) and IPB Section VII).

(c) Perform calibration setup shown in figure 5-6.

NOTE

Label and disconnect wire from MOD input before connecting the 1k Ω resistor and + DC power source.



NOTE

Use RG58/u coax cables for all RF connections.

Figure 5-6. Calibration Setup, RF Oscillator

(d) Set RF Module REC TEST XMIT TEST switch to REC TEST. Set RADIO SELECT switch to PRC-106 (121.5 MHz).

(e) Check external power connections at 13.5 VDC EXT. PWR. TEST SET test points. Apply 13.5 VDC external power.

(f) Apply 12 VDC external power to RF Oscillator as shown in figure 5-6.

NOTE

Refer to figure 5-7 for Oscillator Adjustment Locations.

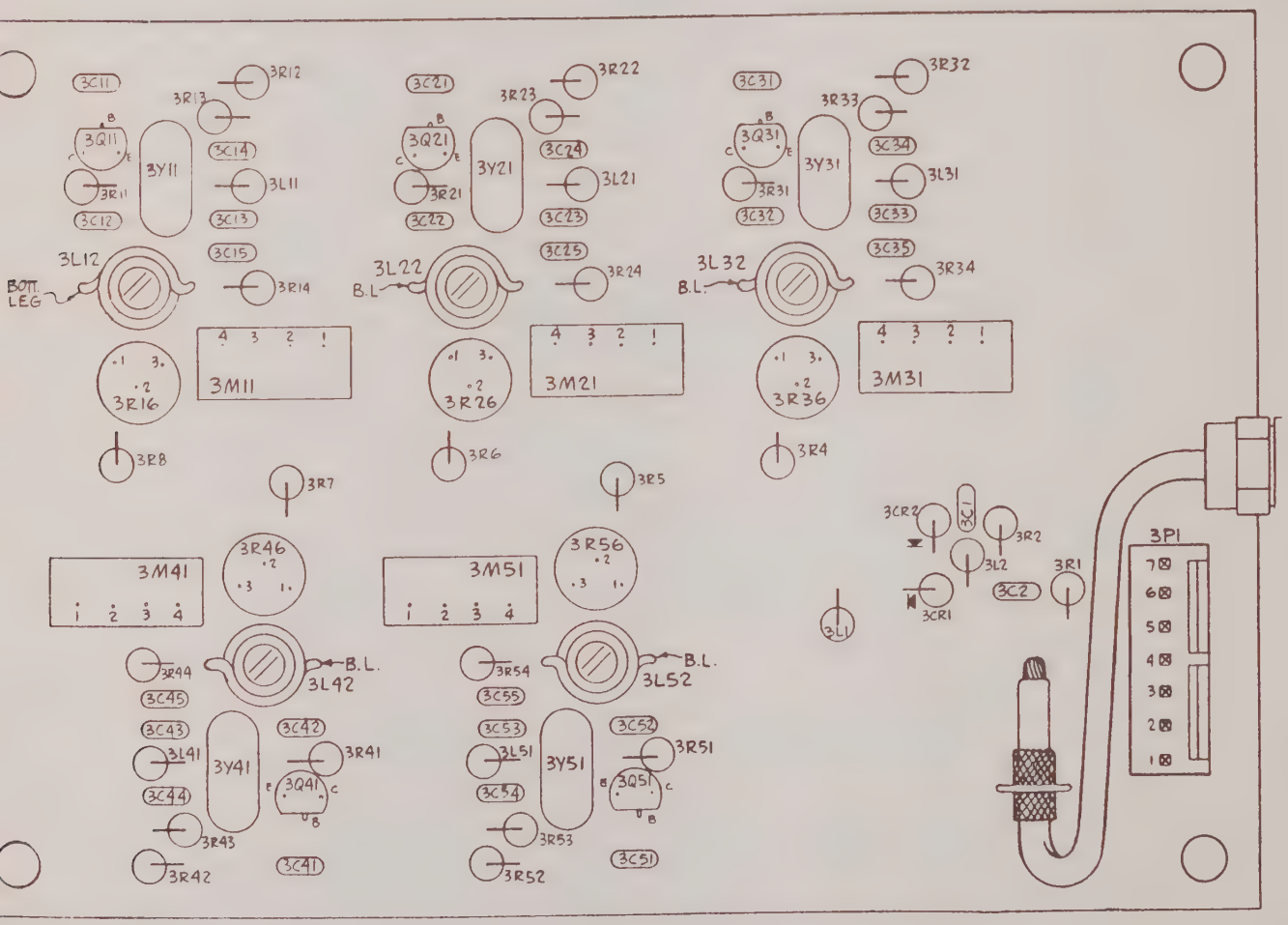


Figure 5-7. RF Oscillator Adjustment Locator

(g) Set RADIO SELECT switch to PRC-106 (121.5 MHz). Depress and hold REC. TEST PRESS pushbutton.

(h) Adjust 3L52 for a frequency counter indication of 121.500 MHz ± 1500 Hz. Adjust 3R56 for a power meter indication of -3.0 dBm ± 3 dB.

(i) Set RADIO SELECT switch to PRC-106 (243.0 MHz). Depress and hold REC. TEST PRESS pushbutton.

(j) Adjust 3L42 for a frequency counter indication of 243.000 MHz ± 3000 Hz. Adjust 3R46 for a power meter indication of -3.0 dBm ± 3 dB.

(k) Set RADIO SELECT switch to URC-64 (247.3 MHz). Depress hold REC. TEST PRESS pushbutton.

(l) Adjust 3L32 for a frequency counter indication 247.300 MHz ± 3000 Hz. Adjust 3R36 for a power meter indication of -3 dBm ± 3 dB.

(m) Set RADIO SELECT switch to URC-64 (248.2 MHz).

(n) Adjust 3L22 for a frequency counter indication of 248.200 MHz ± 3000 Hz. Adjust 3R24 for a power meter indication of -3 Bm ± 3 dB.

(o) Set RADIO SELECT switch to URC-64 (282.8 MHz). Depress and hold REC. TEST PRESS pushbutton.

(p) Adjust 3L12 for a frequency counter indication of 282.800 MHz ± 4000 Hz. Adjust 3R16 for a power meter indication of -3 dBm ± 3 dB.

(q) Set all external power sources off.

(r) Disconnect test setup. Connect RF coaxial cable to internal 40 dB attenuator. Connect MOD input wire.

(s) Assemble RF Oscillator. Assemble Panel Assembly to RF Module Case.

RF Module calibration is complete.

c. Audio Coupler Calibration. The audio coupler on both the 24-RC/PRC-90 and the 24-RC/URC-64 radio cradles must be calibrated also.

(1) Connect an ohmeter across the terminals of the audio coupler.

(2) Set the calibration adjustment screw, located on the back of the audio coupler, for an ohmeter indication of 100 ohms ± 10 ohms.

Audio Coupler calibration is complete.

Section VI. DIAGRAMS

6-1. GENERAL. This section contains the wiring and schematic diagrams necessary to supplement the information provided in the Operation and the Maintenance sections of this manual. Use of these diagrams enables a maintenance technician to ascertain operation, circuit, and troubleshooting information.

6-2. INDEX OF DIAGRAMS.

FO-1. DC Module Schematic

FO-2. DC Module Wiring Diagram

FO-3. RF Module Schematic

FO-4. RF Oscillator Schematic

FO-5. RF Module Wiring Diagram

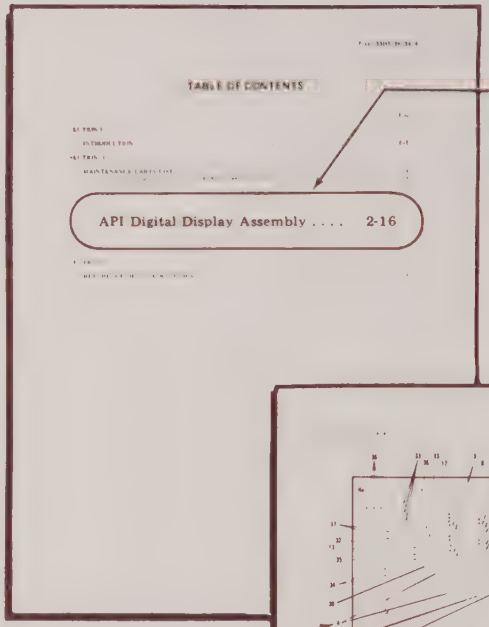
Section VII. ILLUSTRATED PARTS BREAKDOWN

7-1. GENERAL. This Illustrated Parts Breakdown covers the ACR/TS-24(B) Radio Test Set manufactured by ACR Electronics, Inc., Hollywood, Florida. This information has been compiled for use in requisitioning, storing, issuing, and identifying parts and assemblies. Below is an illustrated explanation of how to use the Illustrated Parts Breakdown.

HOW TO USE THE ILLUSTRATED PARTS BREAKDOWN

IF YOU *Don't* KNOW THE PART NUMBER . . .

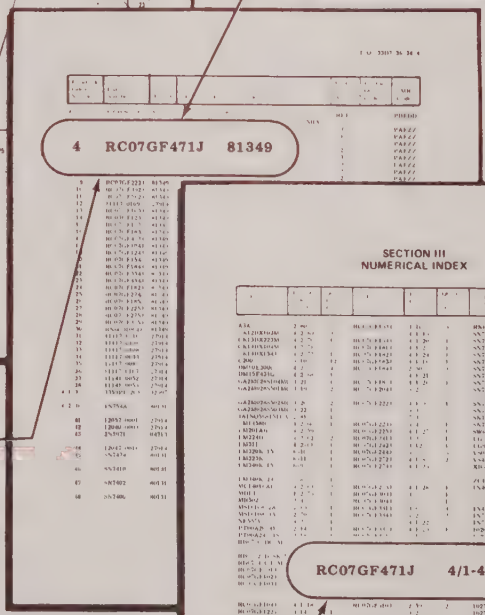
Do This



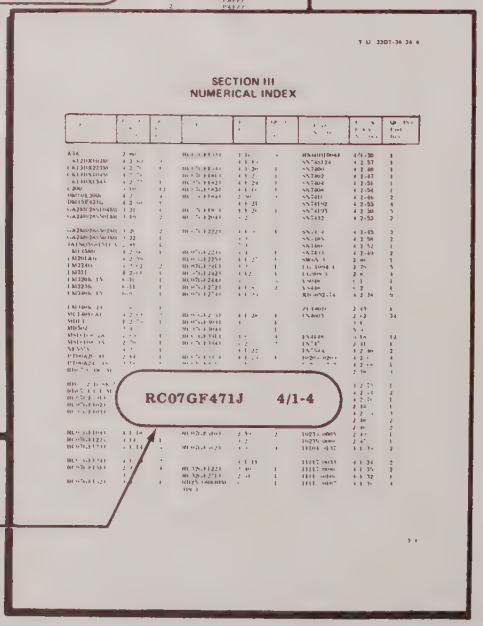
1. Refer to illustration list and select the illustration most likely to contain the desired part.

2. Refer to the page number indicated and find desired part on illustration.

3. Note the Figure Number of the illustration and the Index Number of the part. Refer to the corresponding Figure-Index Number on the Assembly List page for Part Number, Nomenclature, etc.



3. If illustration of part is desired - refer to same Figure and Index Number on accompanying illustration.



2. Turn to Figure and Index Number indicated to obtain desired information.

IF YOU *Do* KNOW THE PART NUMBER . . .

Do This

1. Find the Part Number in the Numerical Parts List. Note the Figure and Index Number where the part is called out in Parts List.

7-2. MAINTENANCE PARTS LIST. The Maintenance Parts List provides a breakdown of the unit into assemblies and detailed parts. An exploded view illustrates how the major assemblies are disassembled into subassemblies and detail parts. Each item illustrated is indexed for identification purposes. Each illustration is accompanied by a parts list providing a part number, item name, and description. It is not intended that this publication be used as an authority for procedure of disassembly or assembly. Items made from raw stock, such as cut lengths of wire and insulating materials, are not included. In general, the assemblies and parts installed at the time the end items were manufactured are listed and identified in the manual. When an assembly or part (including vendor items), which is different from the original, was installed during the manufacture of later items, all assemblies and parts are listed (and "Usable on" coded). However, when the original assembly or part does not have continued application (no spares of the original were procured or such spares are no longer authorized for replacement), only the preferred assembly or part is listed. Also, when an assembly or part was installed during modification, and the original does not have continued application, only the preferred item is listed. Interchangeable and substitute assemblies and parts, subsequently authorized by the Government are not listed in this manual; such items are identified by information available through the Interchangeable and Substitute (I & S) Data Systems. Refer to TO 00-25-184. When a standard size part can be replaced with an oversize or undersize part, the latter parts, showing sizes, are also listed. Repair Parts Kits and Quick Change Units are listed when they are available for replacement.

a. Figure and Index Number Column. The Figure and Index Number column lists the figure and index number assigned to an item to facilitate location and identification on the illustration. The subassemblies which are not illustrated in assembled form are listed but not indexed.

b. Part Number Column. The Part Number column lists the contractors, Government standards, or manufacturers part number. If a manufacturers part number is listed, the contractors part number will be found in the Description column following the description.

c. Federal Supply Codes for Manufacturers (FSCM) Column. The FSCM number column lists a five digit symbol that is a code number for the manufacturer, contractor, or Government standard for the item described and part number listed on the same line as the FSCM. The source of code symbols is the Federal Supply Code for Manufacturers, H4-1. The following is a list of codes, that appear in this IPB, and their associated manufacturer and address in numeric order by FSCM.

FSCM	MANUFACTURER
01037	Pyroferric-New York Inc. 621 E. 216 St. Bronx, NY 10467
02660	Bunker Ramo Corp. Amphenol Connector Div. 2801 S. 25th Ave. Broadview, IL 60153
12040	National Semiconductor Corp. Commerce Dr., P.O. Box 443 Danbury, CT 06810
12598	RLC Electronics Inc. 83 Radio Circle Mt. Kisco, NY 10549
13556	TRW Cinch Manufacturing Co. 1015 S. Sixth St. Minneapolis, MN 55415
15542	Mini-Circuits Laboratory Div. of Scientific Components Corp. 2625 E. 14th St. Brooklyn, NY 11235

FSCM	MANUFACTURER
18560	ACR Electronics Inc. 3901 N. 29th Ave. Hollywood, FL 33020
18796	Erie Technological Products Inc. 644 W. 12th St. Erie, PA 16512
23042	Texscan Corp. 2446 N. Shadeland Ave. Indianapolis, IN 46219
24248	South Chester Corp. Southco Div. Lester, PA 19113
27264	Molex Inc. 2222 Wellington Court Lisle, IL 60532
30161	Aavid Engineering Inc. 30 Cook Ct. Laconia, NH 03246
30695	Small Parts Inc. 8605 N. Lincoln Ave. Morton Grove, IL 60053
39428	McMaster-Carr Supply Co. P.O. Box 4355 Chicago, IL 60680
50056	Gulton Industries Inc. Electrontric Components Div. 212 Durham Ave. Metuchen, NJ 08840
50811	Mouser Corp. 11511 Woodside Ave. Lakeside, CA 92040
51406	Murata Corp. of America 1148 Frankln Rd., S.E. Marietta, GA 30067
52072	Circuit Assembly Corp. 3169 Redhill Ave. Costa Mesa, CA 92626
53184	Xciton Corp. 5 Hemlock St. Latham, NY 12110
53421	Tyton Corp. 7936 N. Faulkner Rd. P.O. Box 23055 Milwaukee, WI 53223
55390	Intersil Inc. 10900 N. Tantau Ave. Cupertino, CA 95014
55566	RAF Electronic Hardware Inc. 260 Hathaway Dr. Stratford, CT 06497
56988	Century Spring Co. Inc. 222 E. 16th St. P.O. Box 15287 Los Angeles, CA 90015
57954	Passive Components Inc. 7863 Bradenton Rd. Sarasota, FL 33580
72136	Electro Motive Corp. Subsidiary of International Electronics Corp. Lauter Ave., P.O. Box 7600 Florence, SC 29501
74970	Johnson, E. F. Co. 299 Tenth Ave. Waseca, MN 56093
79963	Zierick Mfg. Co. Radio Circle Mount Kisco, NY 10549
80294	Bourns Inc. Trimpot Products Div. 1200 Columbia Ave. Riverside, CA 92507
81073	Grayhill Inc. 561 Hillgrove Ave. P.O. Box 373 La Grange, IL 60525

FSCM	MANUFACTURER
81349	Military Specifications
83330	Smith, Herman H., Inc. 812 Snedicker Ave. Brooklyn, NY 11207
90201	Mallory Capacitor Co. Div. P. R. Mallory Co. Inc. 4760 Kentucky Ave. Indianapolis, IN 46206
93958	Republic Electronics Corp. 176 East Seventh St. Paterson, NJ 07524
96906	Military Standards
99800	American Precision Industries Inc. Delevan Div. 270 Quaker Rd. East Aurora, NY 14052

7-3. NUMERICAL INDEX. The Numerical Index, is an alphanumeric listing of all part numbers or identifying nouns listed in the Maintenance Parts List. The identifying noun is considered the part number for commercially procured hardware.

a. Part Number Column. The part number alphanumerical arrangement begins with the left position and continues from left to right, one digit at a time, in accordance with the following system. The order of precedence in the first (left) position arrangement of the part number is: letters A through Z, and numerals 0 through 9. The order of precedence, in the second and succeeding positions is: space (blank), diagonal (slant), point (period), dash (-), letters A through Z, and numerals 0 through 9. Alphabetic O shall be considered zero.

b. Figure and Index Number Column. The Figure and Index Number column lists the figure number of the illustration in which the parts are shown and the index number by which they may be identified. When the figure and index number is preceeded by the letter F, the item has not been assigned a figure and index number that is listed. The figure and index for Government standard parts is shown for the first occurrence only in the Maintenance Parts List.

c. Quantity Per End Item Column. The Quantity Per End Item column lists the total quantity of the part used in the equipment. Where more than one figure and index number is listed, the quantity represents the total.

7-4. REFERENCE DESIGNATION INDEX. The Reference Designation Index, is an alphanumerical listing of all reference designations assigned to electrical and electronic parts and equipment listed in the Maintenance Parts List.

d. Description Column. The Description column lists the overall equipment broken down into assemblies, detail parts, and their attaching parts. Each item is indented to indicate relationship to its next higher assembly (NHA). Each detail part of the assemblies is placed in order of disassembly, except where the order of disassembly is not a relevant factor. Attaching parts are listed following the parts which they attach. This column lists the approved noun name obtained from Cataloging Handbook H6-1, or a name assigned by the manufacturer, using modifiers as necessary. Part numbers identified by Government standards are described by noun name only. Mechanical and electrical items identified by Government standard type with no part number are listed by noun and modifier followed by the applicable Government specification number.

e. Units Per Assembly Column. The Units Per Assembly column lists the total number of units required per assembly for the particular listing. The abbreviation AR is used to indicate quantity as required. The entry REF indicates the item has been listed for reference purposes only.

f. Usable On Code Column. The Usable On Code column indicates the applicability of parts to various models of the equipment covered in this publication. The column is left blank when an assembly or detail part is used on all variations.

g. Source Maintenance and Recoverability (SMR) Code Column. This manual contains Joint Military Services Uniform SMR Codes only. Definitions of these SMR codes are available in TO 00-25-195.

a. Reference Designation Column. The Reference Designation column contains all reference designations shown on the schematics and wiring diagrams.

b. Figure and Index Number Column. The Figure and Index Number column lists the Maintenance Parts List figure and index number assigned to items having electrical and electronic reference designations. When the figure and index number is preceeded by the letter F, the item has not been assigned a figure and index number and follows the figure and index number that is listed.

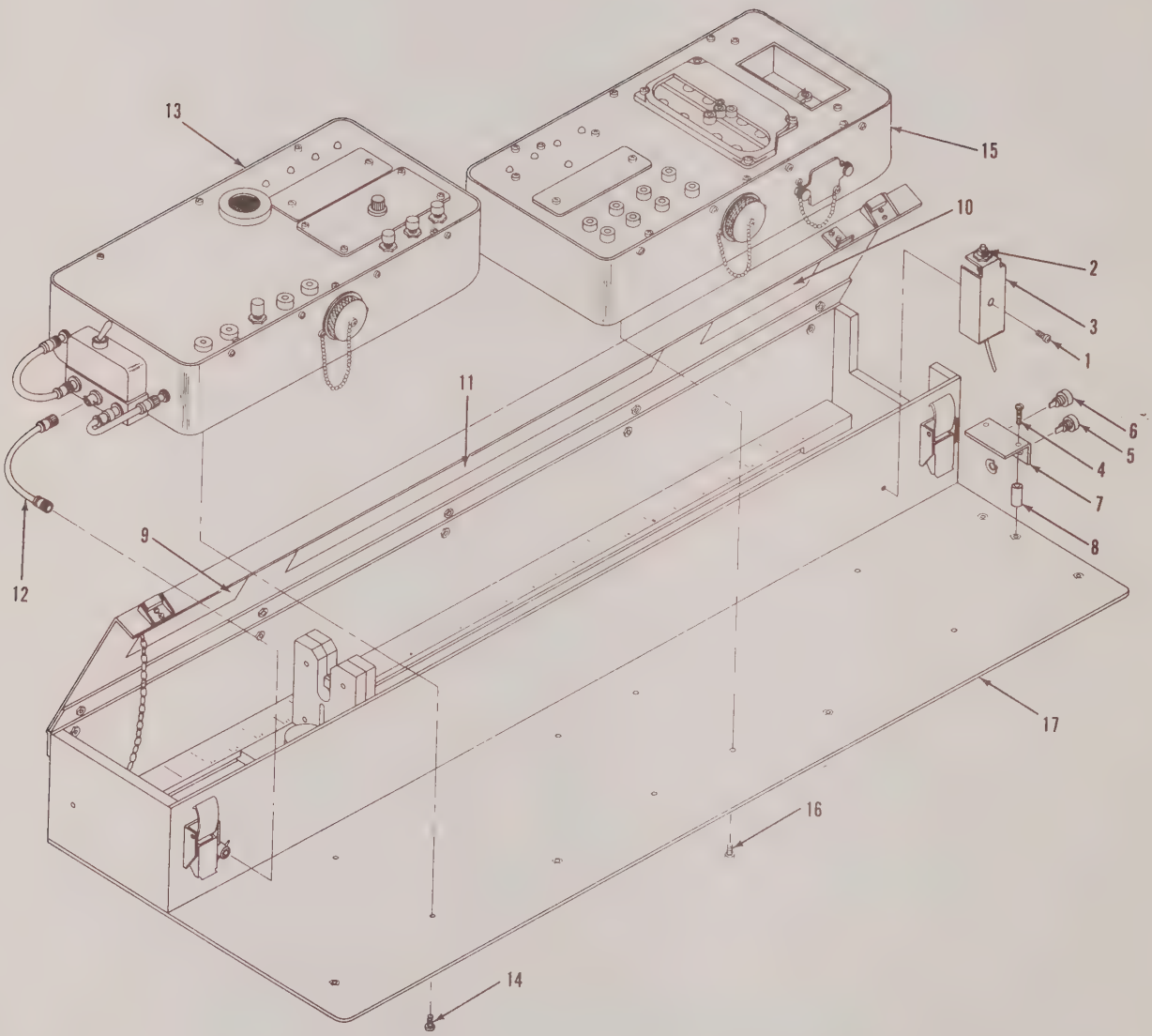


Figure 7-1. ACR/TS-24B Radio Test Set
(Sheet 1 of 2)

Figure & Index Number	Part Number	FSCM	1 2 3 4 5 6 7 Description	Units Per Assy	Usable On Code	SMR Code
7-1/1-	P7-01-0013	18560	TEST SET, Radio, TS-24B	1		
	A3-06-0941	18560	. TEST SET ASSEMBLY	1		
	A3-06-0935	18560	. . SWITCH ASSEMBLY, Interlock	1		
1	MS51957-48	96906	. . SCREW, Machine (AP)	1		
2	39-101	81073	. . . SWITCH, Interlock, ACR No. A1-12-0070 . . .	1		
3	A1-17-0749	18560	. . . BRACKET, Interlock switch	1		
	A3-06-0936	18560	. . BRACKET ASSEMBLY, Audio	1		
4	MS51957-33	96906	. . SCREW, Machine (AP)	2		
5	39F1575	74970	. . . JACK, Tip, ACR No. A1-04-0165. .	1		
6	39F1574	74970	. . . JACK, Tip, ACR No. A1-06-0166. .	1		
7	A1-05-0410	18560	. . . BRACKET, Audio output	1		
8	1130-6A6	55566	. . SPACER, Sleeve, ACR No. A1-05-0424	2		
9	A1-20-0509	18560	. . PLATE, Identification	1		
10	A1-20-0508	18560	. . PLATE, Instruction.	1		
11	A1-20-0507	18560	. . PLATE, Antenna extended	1		
12	A3-06-0938	18560	. . CABLE ASSEMBLY, Coaxial.	3		
13	A3-06-0952	18560	. . MODULE ASSEMBLY, RF (See fig. 2 for breakdown)	1		
14	MS51957-42	96906	. . SCREW, Machine (AP)	4		
15	A3-06-0953	18560	. . MODULE ASSEMBLY, DC (See fig. 7 for breakdown)	1		
16	MS51957-42	96906	. . SCREW, Machine (AP)	4		
17	A3-06-0937	18560	. . TEST CHAMBER AND BASE PLATE. . ASSEMBLY (See fig. 10 for breakdown)	1		

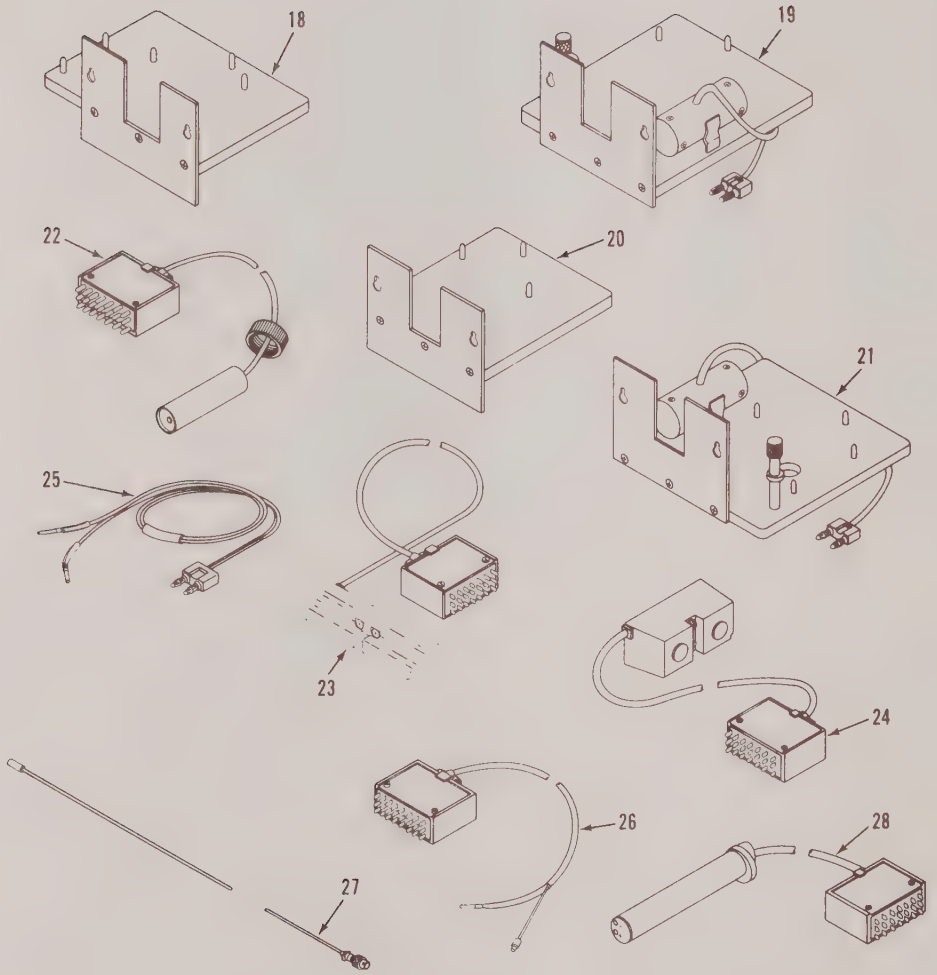


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Figure 7-1. ACR/TS-24B Radio Test Set
(Sheet 2 of 2)

Figure & Index Number	Part Number	FSCM	1 2 3 4 5 6 7 Description	Units Per Assy	Usable On Code	SMR Code
7-1/2-18	A3-06-0918	18560	. RADIO CRADLE, 24-RC/URT-33B	1		
19	A3-06-0916	18560	. RADIO CRADLE, 24-RC/PRC-90/106. . .	1		
20	A3-06-0917	18560	. RADIO CRADLE, 24-RC/URT-33	1		
21	A3-06-0919	18560	. RADIO CRADLE, 24-RC/URC-64	1		
22	A3-06-0920	18560	. BATTERY ADAPTER MODULE, ... 24-BAM/PRC-90/106	1		
23	A3-06-0921	18560	. BATTERY ADAPTER MODULE, ... 24-BAM/URT-33A, C, CM	1		
24	A3-06-0922	18560	. BATTERY ADAPTER MODULE, ... 24-BAM/URT-33B	1		
25	A3-06-0924	18560	. CONNECTER, Battery, 24-BC	1		
26	A3-06-0961	18560	. BATTERY ADAPTER MODULE, ... 24-BAM/URT-33	1		
27	A3-06-0925	18560	. ANTENNA, Flex, 24-FA.	1		
28	A3-06-0960	18560	. BATTERY ADAPTER MODULE, ... 24-BAM/URC-64	1		

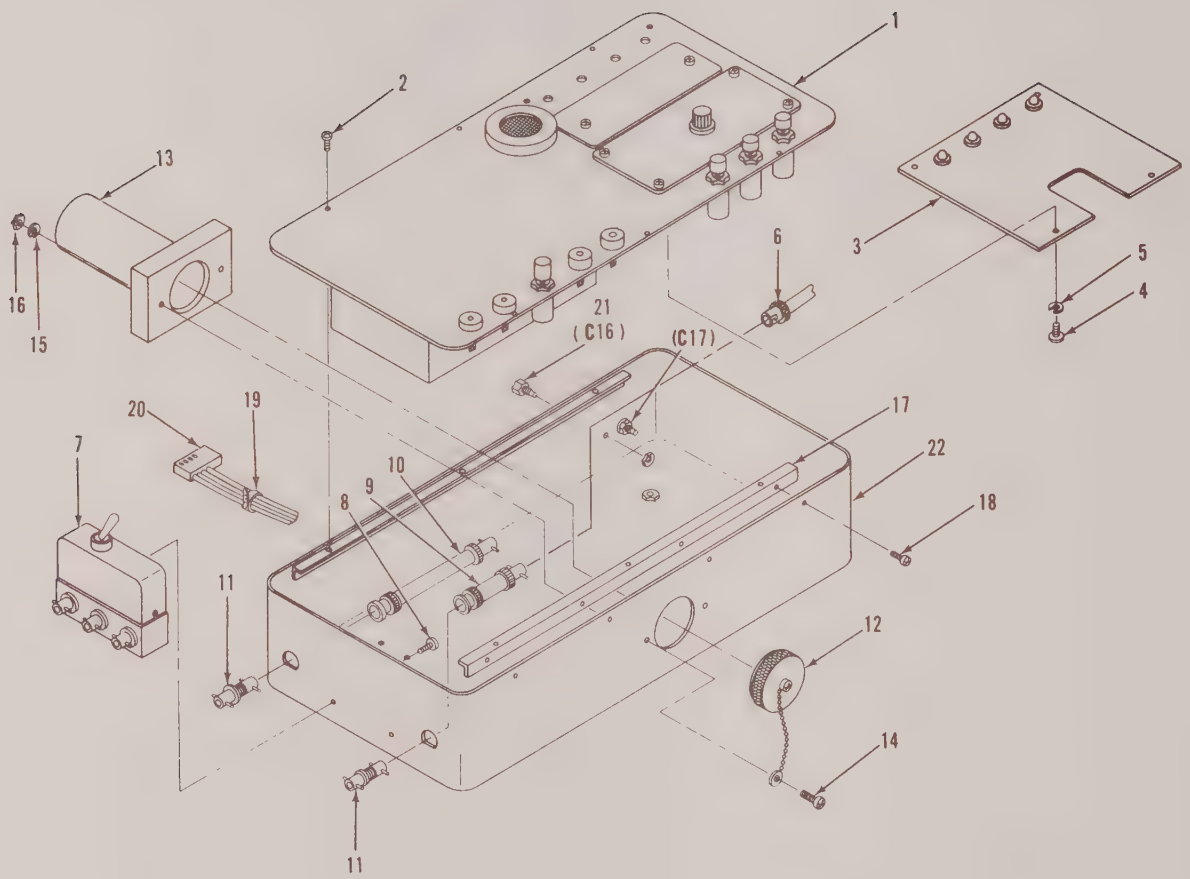

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Figure 7-2. RF Module Assembly

Figure & Index Number	Part Number	FSCM	1 2 3 4 5 6 7 Description	Units Per Assy	Usable On Code	SMR Code
7-2-	A3-06-0952	18560	RF MODULE ASSEMBLY (See fig. 1 for NHA)	REF		
1	A3-06-0939	18560	. PANEL ASSEMBLY, RF Module. (See fig. 3 for breakdown)	1		
2	MS51957-14	96906	. SCREW, Machine (AP)	6		
3	A3-07-0099	18560	. CIRCUIT CARD ASSEMBLY (See fig. 6 for breakdown)	1		
4	MS51957-13	96906	. SCREW, Machine (AP)	4		
5	MS35338-135	96906	. WASHER, Lock (AP)	4		
6	A3-06-0985	18560	. CABLE ASSEMBLY, Attenuator	1		
	A3-06-0933	18560	. CASE ASSEMBLY, RF Module	1		
7	19607	12598	. . SWITCH, Coaxial, ACR No. A1-12-0071	1		
8	MS51957-27	96906	. . SCREW, Machine (AP)	2		
9	FP-50	23042	. . ATTENUATOR, Fixed, ACR No. A1-01-0088	1		
10	L-1071A	12598	. . FILTER, Low pass, ACR No. A1-04-0164	1		
11	31-2220	02660	. . CONNECTOR, Adapter, ACR. No. A1-03-0132	2		
12	A3-06-0947	18560	. . CAP ASSEMBLY, PRC 90/106	1		
13	A3-06-0596	18560	. . BATTERY WELL ASSEMBLY, PRC 90/106	1		
14	MS51957-30	96906	. . SCREW, Machine (AP)	2		
15	MS35338-136	96906	. . WASHER, Lock (AP)	2		
16	MS35649-264	96906	. . NUT, Plain, hexagon (AP)	2		
17	A1-17-0741	18560	. . MOUNTING BAR, Panel	2		
18	MS51957-13	96906	. . SCREW, Machine (AP)	8		
19	T18L	53421	. . TIE, Cable, ACR No. A1-18-0916	4		
20	A3-06-0955	18560	. . SOCKET AND WIRE ASSEMBLY	1		
21	HF-101SA	57954	. . CAPACITOR, Fixed, ACR No. A1-02-0197	2		
22	A1-16-0381	18560	. . CASE, RF Module.	1		

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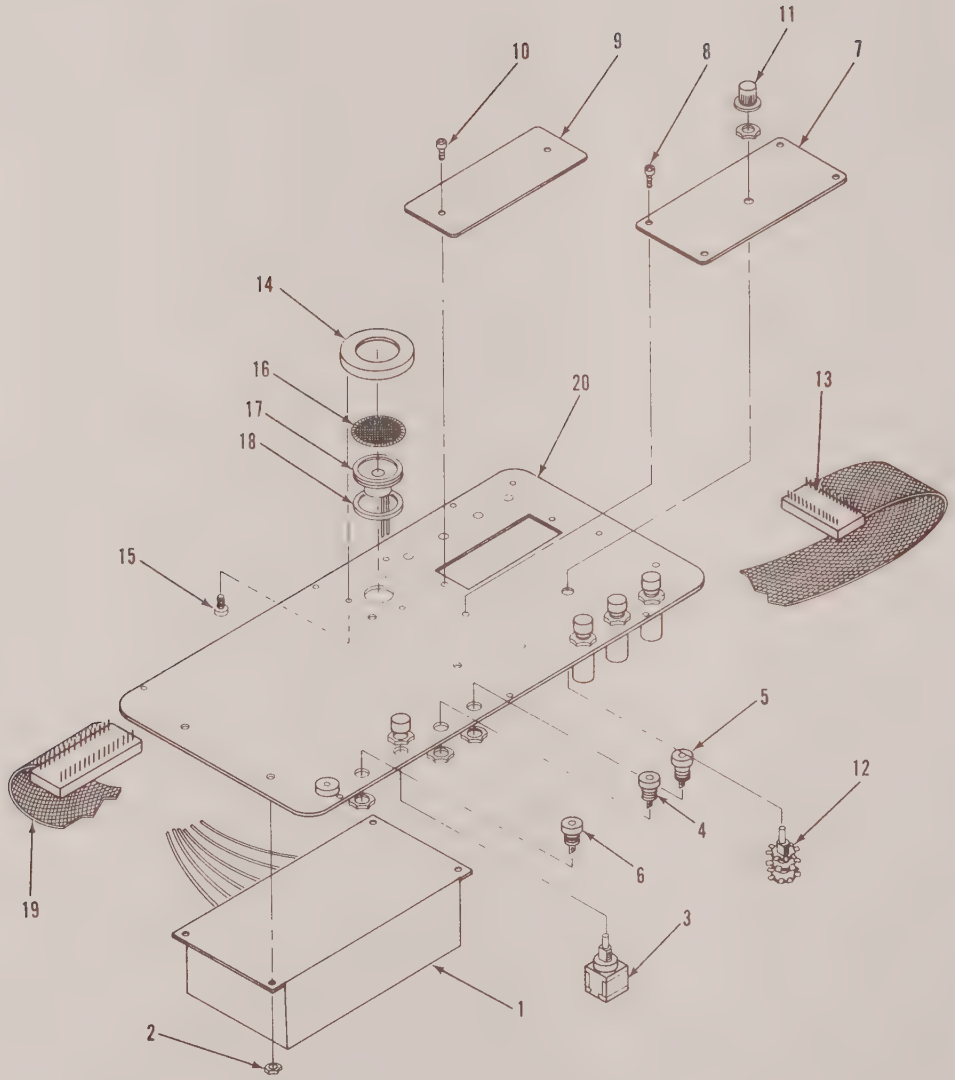

Figure 7-3. RF Module Panel Assembly

Figure & Index Number	Part Number	FSCM	1 2 3 4 5 6 7 Description	Units Per Assy	Usable On Code	SMR Code
7-3-	A3-06-0939	18560	PANEL ASSEMBLY, RF Module . . . . . (See fig. 2 for NHA)	REF		
1	A3-06-0945	18560	. RF OSCILLATOR AND MODULATOR . . . ASSEMBLY (See fig. 4 for breakdown)	1		
2	A1-05-0427	18560	. NUT, Plain, hexagon (AP)	4		
3	A1-12-0050	18560	. SWITCH, Push	4		
4	39F1574	74970	. JACK, Tip, ACR No. A1-04-0166	1		
5	39F1575	74970	. JACK, Tip, ACR No. A1-04-0165	1		
6	39F878	74970	. JACK, Tip, ACR No. A1-04-0167	2		
7	A1-20-0500	18560	. FACEPLATE, Radio select	1		
8	MS51957-13	96906	. SCREW, Machine (AP)	4		
9	A1-20-0501	18560	. COVER, Calibration	1		
10	MS51957-13	96906	. SCREW, Machine (AP)	2		
11	A1-05-0377	18560	. KNOB	1		
	A3-06-0946	18560	. SWITCH ASSEMBLY	1		
12	71AD36-02-1-AJN	81073	. . SWITCH, Rotary, ACR No. A1-12-0072	1		
13	A1-03-0136	18560	. . CABLE ASSEMBLY	1		
14	A1-05-0413	18560	. MOUNTING RING, Speaker	1		
15	MS51957-12	96906	. SCREW, Machine (AP)	3		
16	A1-17-0725	18560	. GRILL, Speaker	1		
17	A3-06-0896	18560	. SPEAKER ASSEMBLY	1		
18	A1-18-0951	18560	. GASKET	1		
19	A1-03-0136	18560	. CABLE ASSEMBLY	1		
20	A1-20-0498	18560	. PANEL, RF	1		

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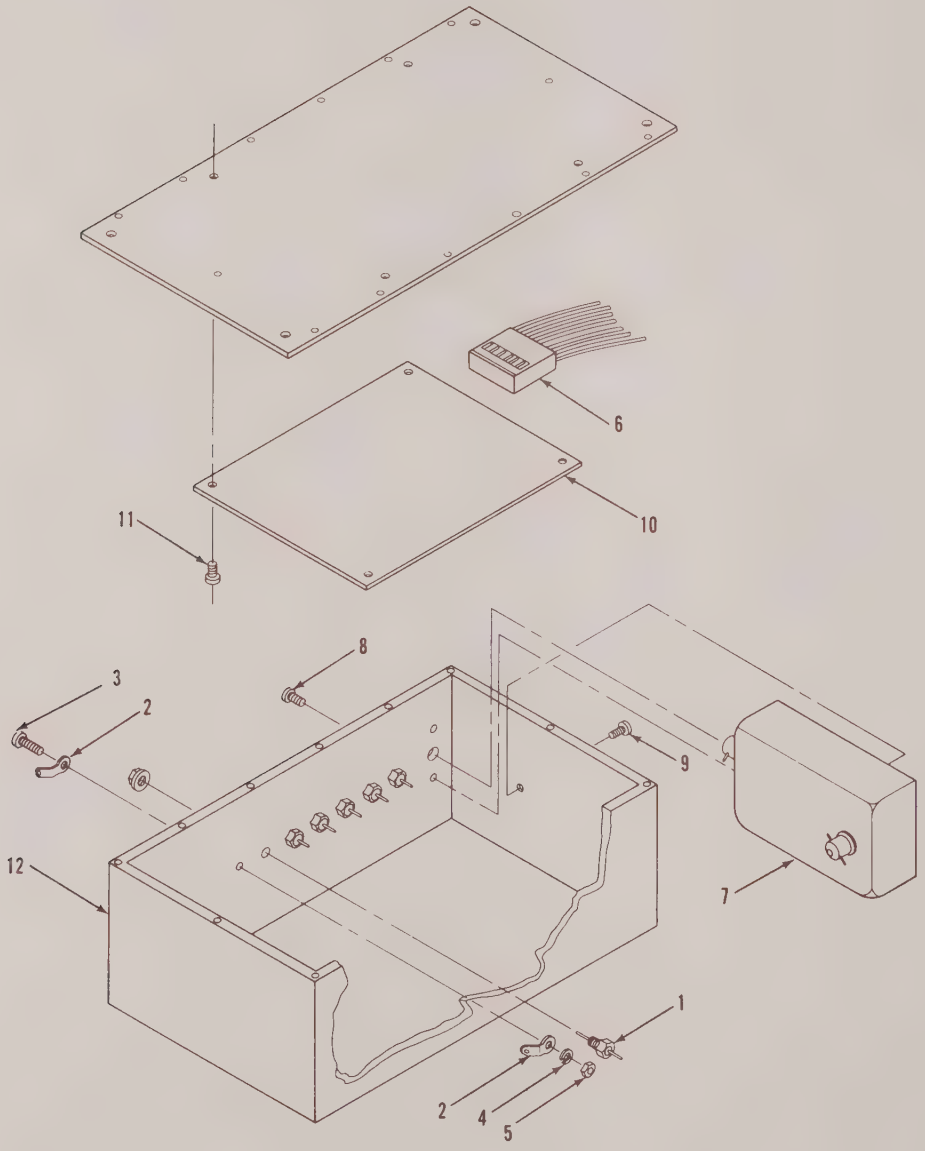

Figure 7-4. RF Oscillator and Modulator Assembly

Figure & Index Number	Part Number	FSCM	1 2 3 4 5 6 7 Description	Units Per Assy	Usable On Code	SMR Code
7-4-	A3-06-0945	18560	RF OSCILLATOR AND MODULATOR. . . . . ASSEMBLY (See fig. 3 for NHA)	REF		
1	HF-101SA	57954	. CAPACITOR, Feed-thru, ACR No. A1-02-0197	6		
2	75-0.144	79963	. TERMINAL, Lug, ACR No. A1-05-0011-3	2		
3	MS51957-15	96906	. SCREW, Machine (AP)	1		
4	MS35338-135	96906	. WASHER, Lock (AP)	1		
5	MS35649-244	96906	. NUT, Plain, hexagon (AP)	1		
6	A3-06-0958	18560	. CONNECTOR ASSEMBLY	1		
7	A3-06-0957	18560	. ATTENUATOR ASSEMBLY	1		
8	MS51957-13	96906	. SCREW, Machine (AP)	2		
9	MS51957-26	96906	. SCREW, Machine (AP)	1		
10	A3-07-0101	18560	. CIRCUIT CARD ASSEMBLY, RF . . . . . Oscillator (See fig. 5 for breakdown)	1		
11	MS51957-12	96906	. SCREW, Machine (AP)	4		
12	A1-16-0382	18560	. CASE, Shielded	1		

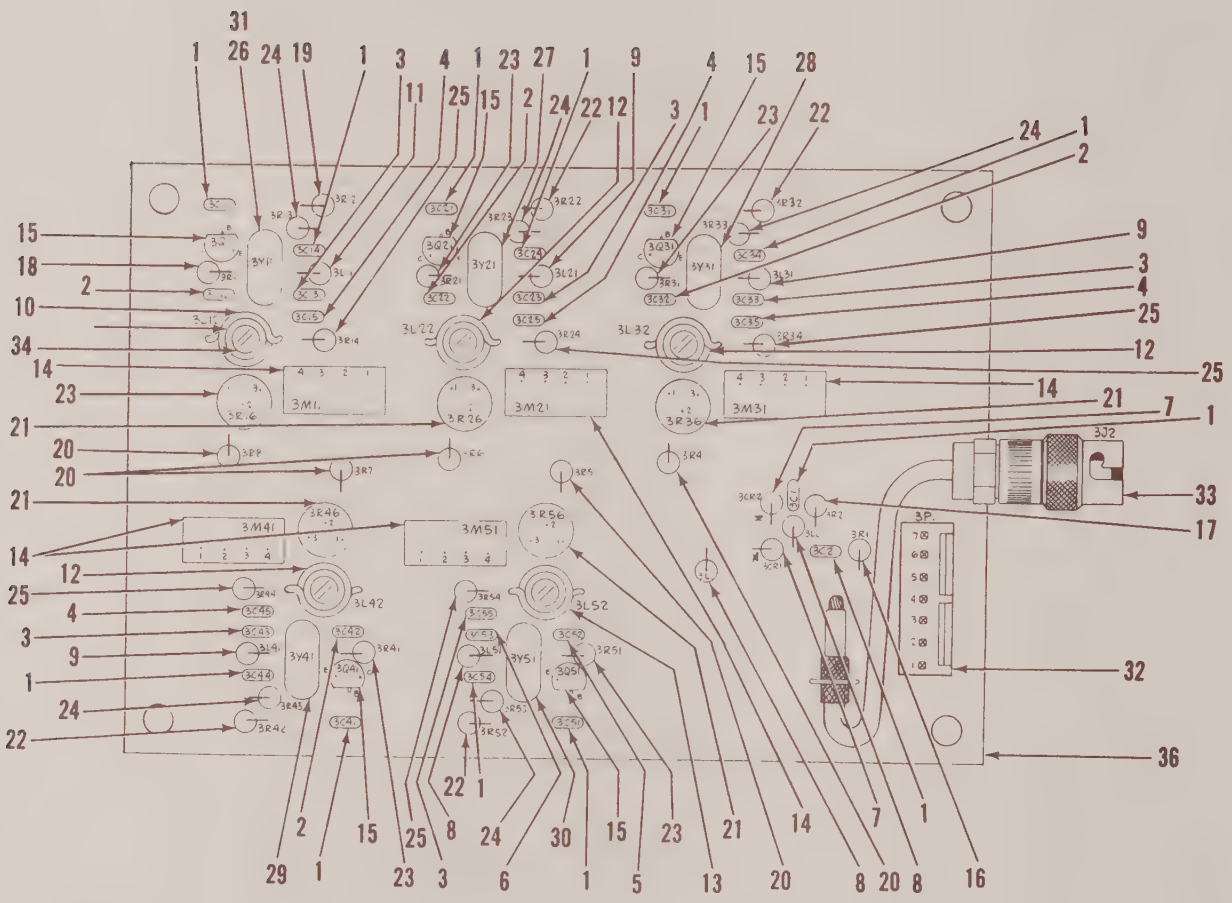

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Figure 7-5. RF Oscillator Circuit Card Assembly

Figure & Index Number	Part Number	FSCM	1 2 3 4 5 6 7 Description	Units Per Assy	Usable On Code	SMR Code
7-5-	A3-07-0101	18560	. CIRCUIT CARD ASSEMBLY, RF. . . . . Oscillator (See fig. 4 for NHA)	REF		
1	A1-02-0099	18560	. CAPACITOR, Fixed	12		
2	A1-02-0107	18560	. CAPACITOR, Fixed	4		
3	A1-02-0190-1	18560	. CAPACITOR, Fixed	5		
4	RA50-120RPE-110	51406	. CAPACITOR, Fixed, ACR No. A1-02-0200-11	4		
5	A1-02-0100	18560	. CAPACITOR, Fixed	1		
6	1D50RM	93958	. CAPACITOR, Fixed, ACR No. A1-02-0031-1	1		
7	A1-11-0181	18560	. SEMICONDUCTOR DEVICE	2		
8	1025-20	99800	. COIL, RF, ACR No. A1-08-0020-8	3		
9	1025-96	99800	. COIL, RF, ACR No. A1-08-0027	3		
10	A1-08-0054-1	18560	. COIL, RF.	1		
11	A1-08-0020-2	18560	. COIL, RF.	1		
12	A1-08-0054-2	18560	. COIL, RF.	3		
13	A1-08-0054-3	18560	. COIL, RF.	1		
14	SK-2	15542	. INTEGRATED CIRCUIT, ACR No. A1-11-0179	5		
15	2N5770	81349	. TRANSISTOR	5		
16	RCR07G470J	81349	. RESISTOR, Fixed	1		
17	RCR07G471J	81349	. RESISTOR, Fixed	1		
18	RCR07G103J	81349	. RESISTOR, Fixed	1		
19	RCR07G472J	81349	. RESISTOR, Fixed	1		
20	RCR07G270J	81349	. RESISTOR, Fixed	5		
21	3329H-1-201	80294	. RESISTOR, Variable, ACR No. A1-01-0093	5		
22	RCR07G102J	81349	. RESISTOR, Fixed	4		
23	RCR07G222J	81349	. RESISTOR, FIxed	4		
24	RCR07G391J	81349	. RESISTOR, Fixed	5		
25	RCR07G220J	81349	. RESISTOR, Fixed	5		
26	A1-24-0001-6	18560	. CRYSTAL, Quartz	1		
27	A1-24-0001-5	18560	. CRYSTAL, Quartz	1		
28	A1-24-0001-4	18560	. CRYSTAL, Quartz	1		
29	A1-24-0001-1	18560	. CRYSTAL, Quartz	1		
30	A1-24-0036-1	18560	. CRYSTAL, Quartz	1		
31	A1-04-0159	18560	. INSULATOR	5		
32	22-27-2071	27264	. CONNECTOR, Receptacle, ACR. . . . . No. A1-03-0144	1		
33	A3-06-0963	18560	. CABLE ASSY	1		
34	P8670	01037	. TUNING CORE, ACR No. A1-04-0027. . .	5		
35	A1-04-0028	18560	. COIL FORM	5		
36	A1-07-0290	18560	. PRINTED CIRCUIT BOARD	1		

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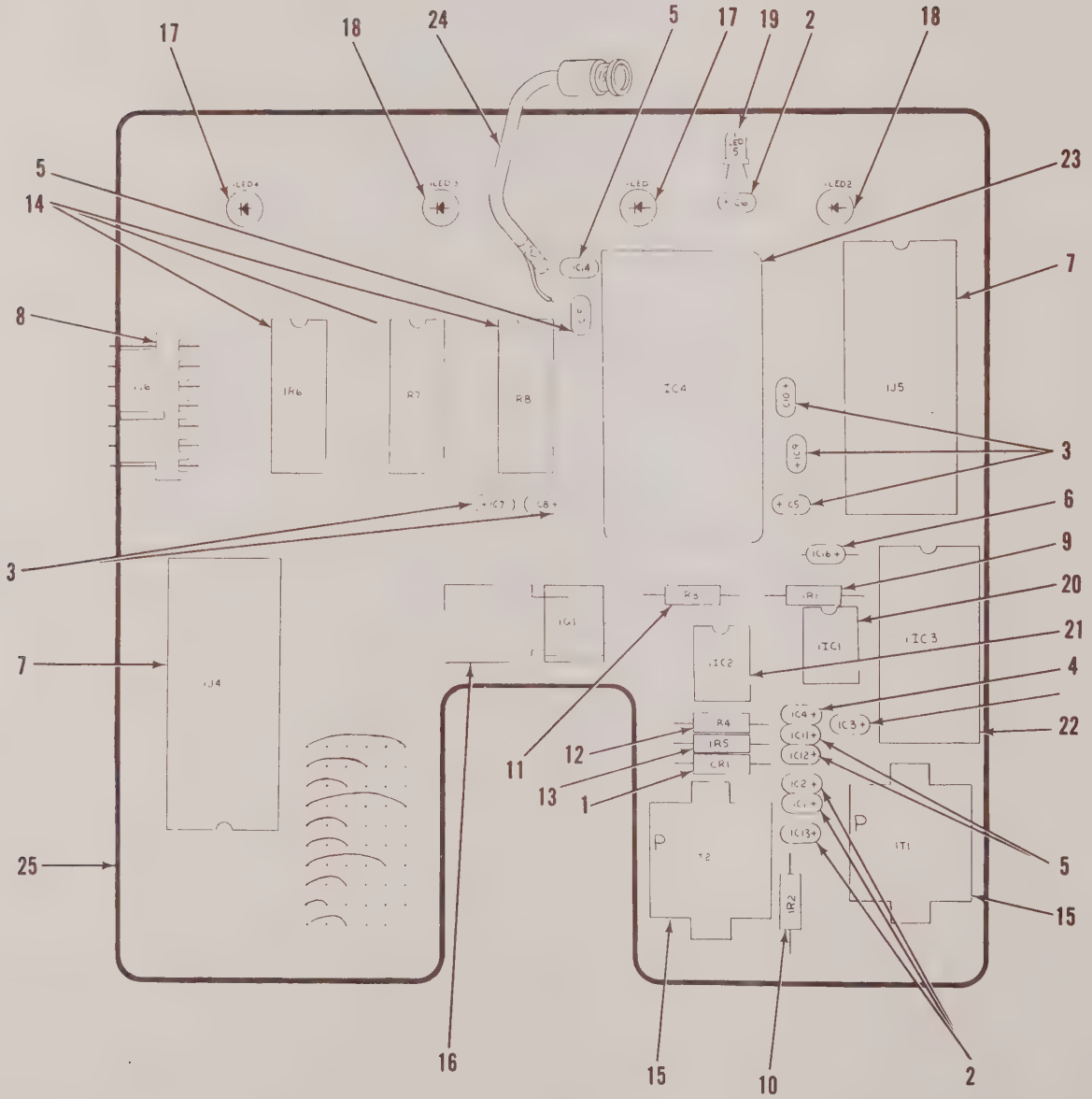

Figure 7-6. RF Module Circuit Card Assembly

Figure & Index Number	Part Number	FSCM	1 2 3 4 5 6 7 Description	Units Per Assy	Usable On Code	SMR Code
7-6-	A3-07-0099	18560	CIRCUIT CARD ASSEMBLY, RF . . . . . Module (See fig. 2 for NHA)	REF		
1	JAN1N4148	81349	. SEMICONDUCTOR DEVICE, Diode	1		
2	A1-02-0148-4	18560	. CAPACITOR, Fixed	4		
3	A1-02-0148-6	18560	. CAPACITOR, Fixed	6		
4	835-000-Z5V 0502Z	18796	. CAPACITOR, Fixed, ACR No. A1-02-0043	1		
5	A1-02-0099	18560	. CAPACITOR, Fixed	4		
6	ECSF16E68	90201	. CAPACITOR, Fixed, ACR No. A1-02-0143-2	1		
7	CA-28S-10SD	52072	. CONNECTOR, Receptacle, ACR No. . . . A1-03-0137	2		
8	22-05-3071	27264	. CONNECTOR, Receptacle, ACR No. . . . A1-03-0149	1		
9	RCR07G103J	81349	. RESISTOR, Fixed	1		
10	RCR07G104J	81349	. RESISTOR, Fixed	1		
11	RCR07G6R8J	81349	. RESISTOR, Fixed	1		
12	RCR07G335J	81349	. RESISTOR, Fixed	1		
13	RCR07G474J	81349	. RESISTOR, Fixed	1		
14	7104D-410-103	80294	. RESISTOR, Variable, ACR No. A1-01-0091	3		
15	42TM004	50811	. TRANSFORMER, ACR No. A1-09-0059	2		
16	D42C5	12040	. TRANSISTOR, ACR No. A1-11-0135 . . .	1		
17	XC-5057-R	53184	. LIGHT EMITTING DIODE, ACR. . . . . No. A1-11-0174	2		
18	XC-5059-G	53184	. LIGHT EMITTING DIODE, ACR. . . . . No. A1-11-0176	2		
19	XC-5491	53184	. LIGHT EMITTING DIODE, ACR. . . . . No. A1-11-0182	1		
20	LM555C	12040	. INTEGRATED CIRCUIT, ACR. . . . . No. A1-11-0175	1		
21	ICL7663CPA	55390	. INTEGRATED CIRCUIT, ACR. . . . . No. A1-11-0173	1		
22	LH0091CD	12040	. INTEGRATED CIRCUIT, ACR. . . . . No. A1-11-0177	1		
23	A1-11-0169	18560	. INTEGRATED CIRCUIT	1		
24	A3-06-0967	18560	. CABLE ASSY.	1		
25	A1-07-0298	18560	. PRINTED CIRCUIT BOARD	1		

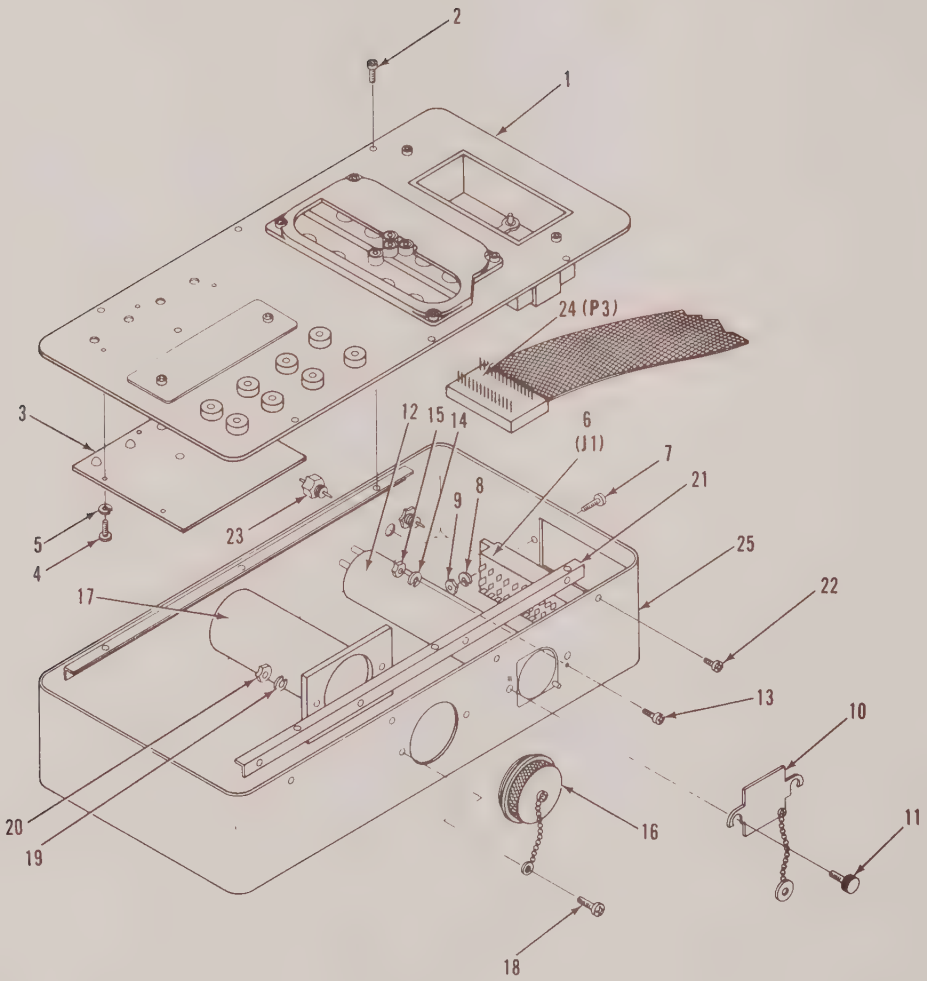

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Figure 7-7. DC Module Assembly

Figure & Index Number	Part Number	FSCM	1 2 3 4 5 6 7 Description	Units Per Assy	Usable On Code	SMR Code
7-7-	A3-06-0953	18560	MODULE ASSEMBLY, DC (See fig. 1 for NHA)	REF		
1	A3-06-0940	18560	. PANEL ASSEMBLY, DC Module (See fig. 8 for breakdown)	1		
2	MS51957-14	96906	. SCREW, Machine (AP)	6		
3	A3-07-0100	18560	. CIRCUIT CARD ASSEMBLY, DC Module (See fig. 9 for breakdown)	1		
4	MS51957-13	96906	. SCREW, Machine (AP)	5		
5	MS35338-135	96906	. WASHER, Lock (AP)	5		
	A3-06-0934	18560	. CASE ASSEMBLY, DC Module	1		
6	S-321-EB	13556	. . CONNECTOR, Receptacle, ACR No. A1-03-0133	1		
7	MS51957-28	96906	. . SCREW, Machine (AP)	2		
8	MS35338-136	96906	. . WASHER, Lock (AP)	2		
9	MS35649-264	96906	. . NUT, Plain, hexagon (AP)	2		
10	A3-06-0949	18560	. . RETAINER ASSEMBLY, Battery	1		
11	7124-A-22	55566	. . SCREW, Thumb (AP), ACR No. A1-05-0432	2		
12	A3-06-0944	18560	. . BATTERY WELL ASSEMBLY	1		
13	MS51959-33	96906	. . SCREW, Machine	2		
14	MS35338-136	96906	. . WASHER, Lock	2		
15	MS35264-264	96906	. . NUT, Plain, hexagon	2		
16	A3-06-0947	18560	. . CAP ASSEMBLY	1		
17	A3-06-0956	18560	. . BATTERY WELL ASSEMBLY	1		
18	MS51957-30	96906	. . SCREW, Machine (AP)	2		
19	MS35338-136	96906	. . WASHER, Lock (AP)	2		
20	MS35264-264	96906	. . NUT, Plain, hexagon (AP)	2		
21	A1-17-0741	18560	. . MOUNTING BAR, Panel	2		
22	MS51957-13	96906	. . SCREW, Machine (AP)	8		
23	HF-101SA	57954	. . CAPACITOR, Fixed, ACR No. A1-02-0197	2		
24	A1-03-0136	18560	. . CABLE, Ribbon	1		
25	A1-16-0379	18560	. . CASE, DC Module	1		

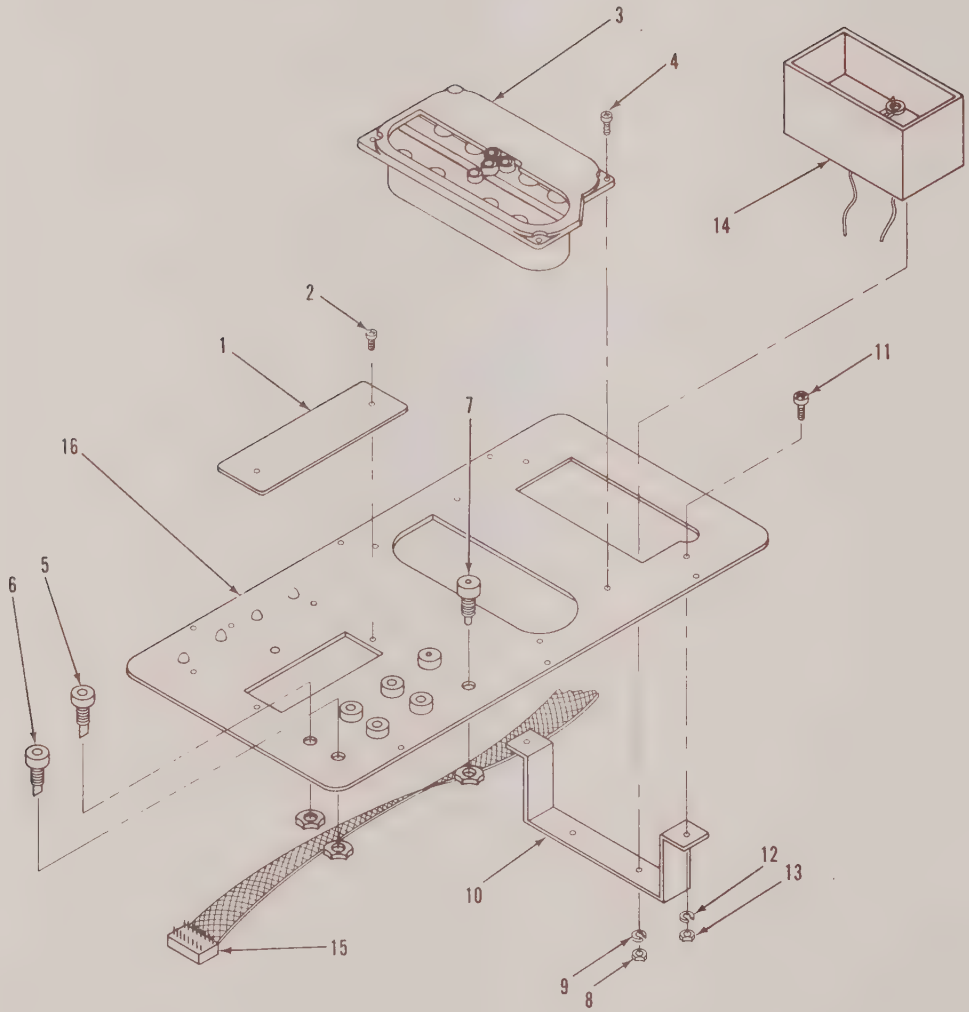

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Figure 7-8. DC Module Panel Assembly

Figure & Index Number	Part Number	FSCM	1 2 3 4 5 6 7 Description	Units Per Assy	Usable On Code	SMR Code
7-8-	A3-06-0940	18560	PANEL ASSEMBLY, DC Module . . . . . (See fig. 7 for NHA)	REF		
1	A1-20-0502	18560	. COVER, Calibration	1		
2	MS51957-13	96906	. SCREW, Machine (AP)	2		
3	A3-06-0231	18560	. BACKPLATE ASSEMBLY	1		
4	MS51957-14	96906	. SCREW, Machine (AP)	4		
5	39F1574	74970	. JACK, Tip, ACR No. A1-04-0166	3		
6	39F1575	74970	. JACK, Tip, ACR No. A1-04-0165	3		
7	39F878	74970	. JACK, Tip, ACR No. A1-04-0167	2		
8	MS35248-284	96906	. NUT, Plain, hexagon	2		
9	MS35338-137	96906	. WASHER, Lock	2		
10	A1-05-0414	18560	. BRACKET, Battery well	1		
11	MS51957-43	96906	. SCREW, Machine (AP)	2		
12	MS35338-137	96906	. WASHER, Lock (AP)	2		
13	MS35649-248	96906	. NUT, Plain, hexagon (AP)	2		
14	A3-06-0943	18560	. BATTERY WELL ASSEMBLY	1		
15	CA-S16-P00-281-C0-24	52072	. CONNECTOR, Plug, ACR No. A1-03-0148	1		
16	A1-20-0499	18560	. PANEL, DC Module	1		

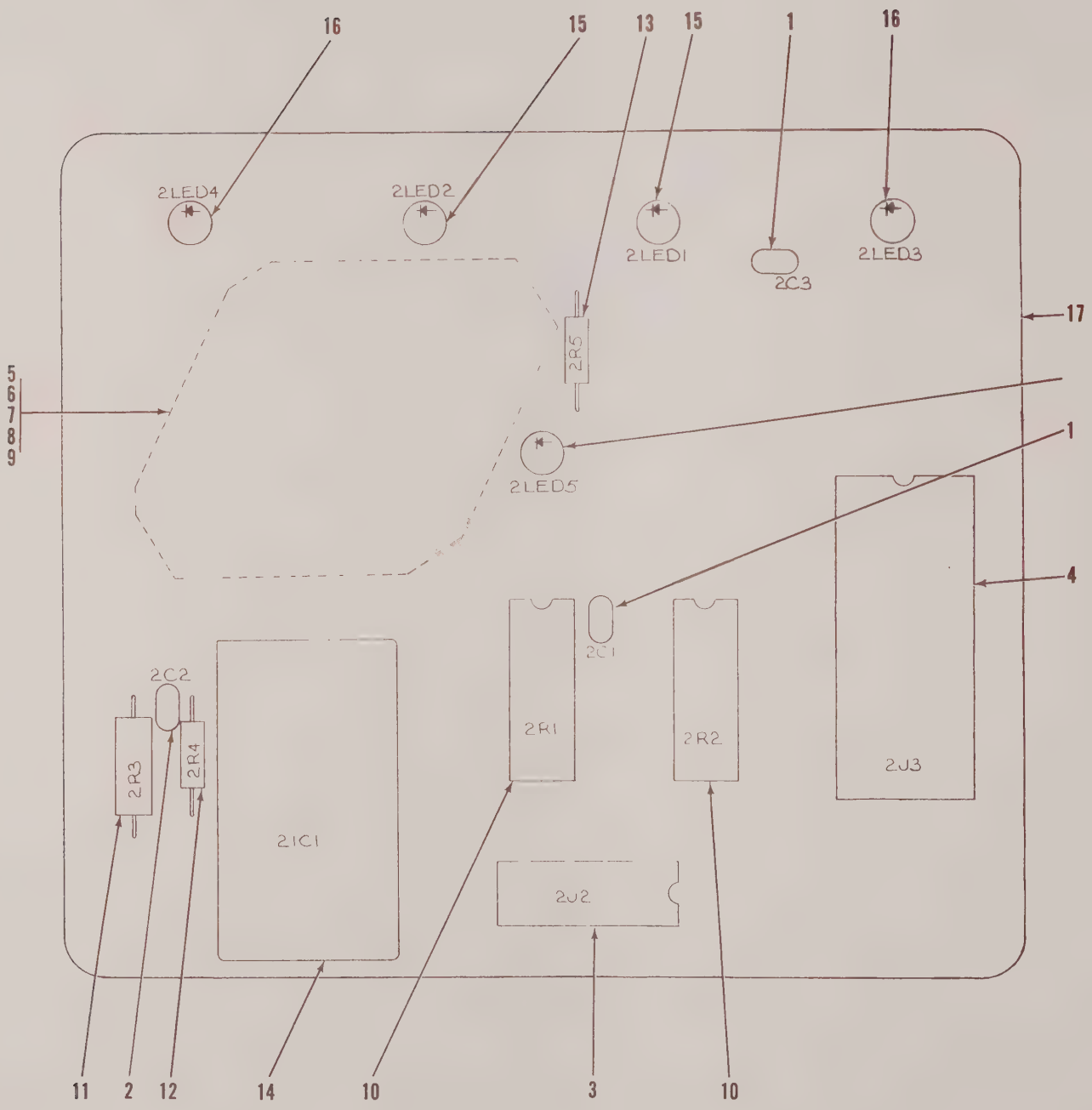

Figure 7-9. DC Module Circuit Card Assembly

Figure & Index Number	Part Number	FSCM	1 2 3 4 5 6 7 Description	Units Per Assy	Usable On Code	SMR Code
7-9-	A3-07-100	18560	CIRCUIT CARD ASSEMBLY, DC . . . . . Module (See fig. 7 for NHA)	REF		
1	A1-02-0099	18560	. CAPACITOR, Fixed	2		
2	A1-02-0148-4	18560	. CAPACITOR, Fixed	1		
3	CA-16S-10SD	52072	. CONNECTOR, Receptacle, ACR No. . . . A1-03-0147	1		
4	CA-28S-10SD	52072	. CONNECTOR, Receptacle, ACR No. . . . A1-03-0137	1		
5	2N1544	81349	. TRANSISTOR	1		
6	MS51957-32	96906	. SCREW, Machine (AP)	2		
7	MS35338-136	96906	. WASHER, Lock (AP)	2		
8	MS35649-264	96906	. NUT, Plain, hexagon (AP)	2		
9	5014-3	30161	. HEAT SINK, ACR No. A1-04-0170	1		
10	7104D-410-103	80294	. RESISTOR, Variable, ACR No. A1-01-0091	2		
11	A1-01-0092	18560	. RESISTOR, Fixed	1		
12	RCR07G681J	81349	. RESISTOR, Fixed	1		
13	RCR07G561J	81349	. RESISTOR, Fixed	1		
14	A1-11-0170	18560	. INTEGRATED CIRCUIT	1		
15	XC-5059-G	53184	. LIGHT EMITTING DIODE, ACR . . . . . No. A1-11-0176	2		
16	XC-5057-R	53184	. LIGHT EMITTING DIODE, ACR . . . . . No. A1-11-0174	3		
17	A1-07-0296	18560	. PRINTED CIRCUIT BOARD	1		

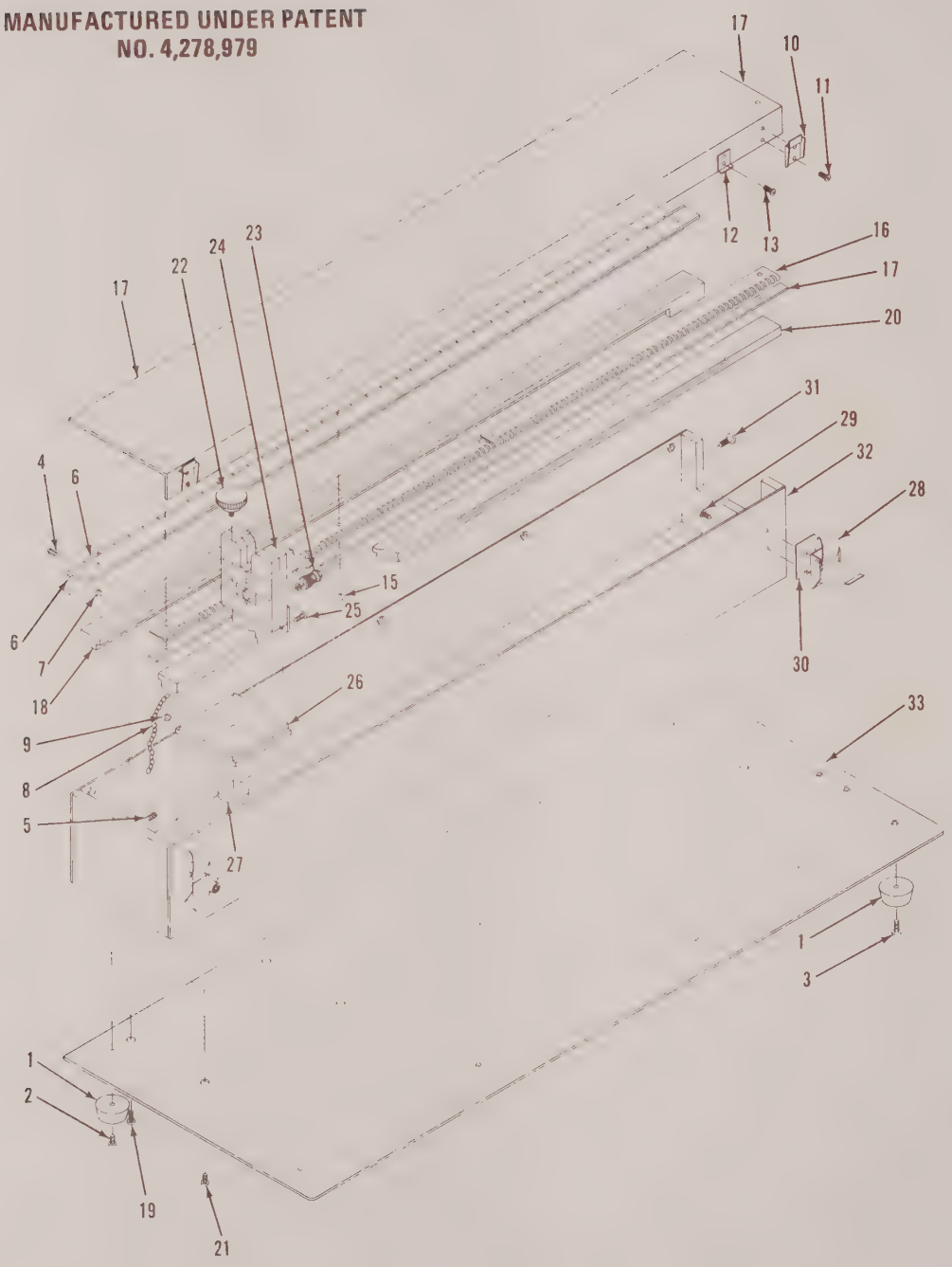

Figure 7-10. Test Chamber and Baseplate Assembly

Figure & Index Number	Part Number	FSCM	1 2 3 4 5 6 7 Description	Units Per Assy	Usable On Code	SMR Code
7-10-	A3-06-0937	18560	TEST CHAMBER AND BASEPLATE ASSEMBLY (See fig. 1 for NHA)	REF		
1	2135	83330	. BUMPER, ACR No. A1-05-0028-2	11		
2	MS51957-45	96906	. SCREW, Machine (AP)	7		
3	MS51957-42	96906	. SCREW, Machine (AP)	4		
	A3-06-0932	18560	. TEST CHAMBER ASSEMBLY	1		
	A3-06-0931	18560	. . LID ASSEMBLY, Test chamber	1		
4	MS51957-40	96906	. . SCREW, Machine (AP)	5		
5	MS51957-26	96906	. . SCREW, Machine (AP)	1		
6	A1-05-0409	18560	. . . HINGE, Continuous	1		
7	A1-05-0428	18560	. . . NUT, Plain, hexagon (AP)	5		
8	3617T3	39428	. . . CHAIN, Weldless, ACR No. A1-05-0421	1		
9	MS35649-264	96906	. . . NUT, Plain, hexagon (AP)	1		
10	A1-05-0411-2 A3-06-0938	18560	. . . KEEPER (Part of 24248 part no. 97-50-112-2)	2		
11	MS51957-40	96906	. . . SCREW, Machine (AP)	2		
12	A1-17-0750	18560	. . . BRACKET, Switch actuating	1		
13	MS51957-25	96906	. . . SCREW, Machine (AP)	2		
14	A1-17-0742	18560	. . . RETAINER, Gasket	1		
15	MS35649-284	96906	. . . NUT, Plain, hexagon (AP)	5		
16	A1-05-0378	18560	. . . GASKET	1		
17	A1-16-0378	18560	. . . LID, Test chamber	1		
	A3-06-0930	18560	. . CASE ASSEMBLY, Test chamber	1		
18	A1-17-0747	18560	. . . RAIL, Engraved	1		
19	MS51957-42	96906	. . . SCREW, Machine (AP)	5		
20	A1-17-0745	18560	. . . RAIL, Cable carrying	1		
21	MS51957-42	96906	. . . SCREW, Machine (AP)	5		
22	KK-5	30695	. . . KNOB, ACR No. A1-05-0420	1		
23	A3-06-0929	18560	. . . CABLE ASSEMBLY	1		
24	A3-06-0928	18560	. . . LOAD CARRIAGE ASSEMBLY. (See fig. 11 for breakdown)	1		
25	MS51959-45	96906	. . . SCREW, Machine (AP)	3		
26	A1-17-0748	18560	. . . SLIDE, Load carriage	1		
27	A1-17-0746	18560	. . . FOOT, Contact	1		
28	A1-05-0411-1	18560	. . . LATCH (Part of 24248 part no. 97-50-112-2)	2		
29	MS51957-42	96906	. . . SCREW, Machine (AP)	4		
30	A1-17-0703	18560	. . . SHIM, Latch	2		
31	A1-05-0412	18560	. . . BUTTON, Radio carriage mounting	2		
32	A3-06-0915	18560	. . . CHANNEL AND END PLATE ASSEMBLY	1		
33	A1-17-0740	18560	. BASEPLATE	1		

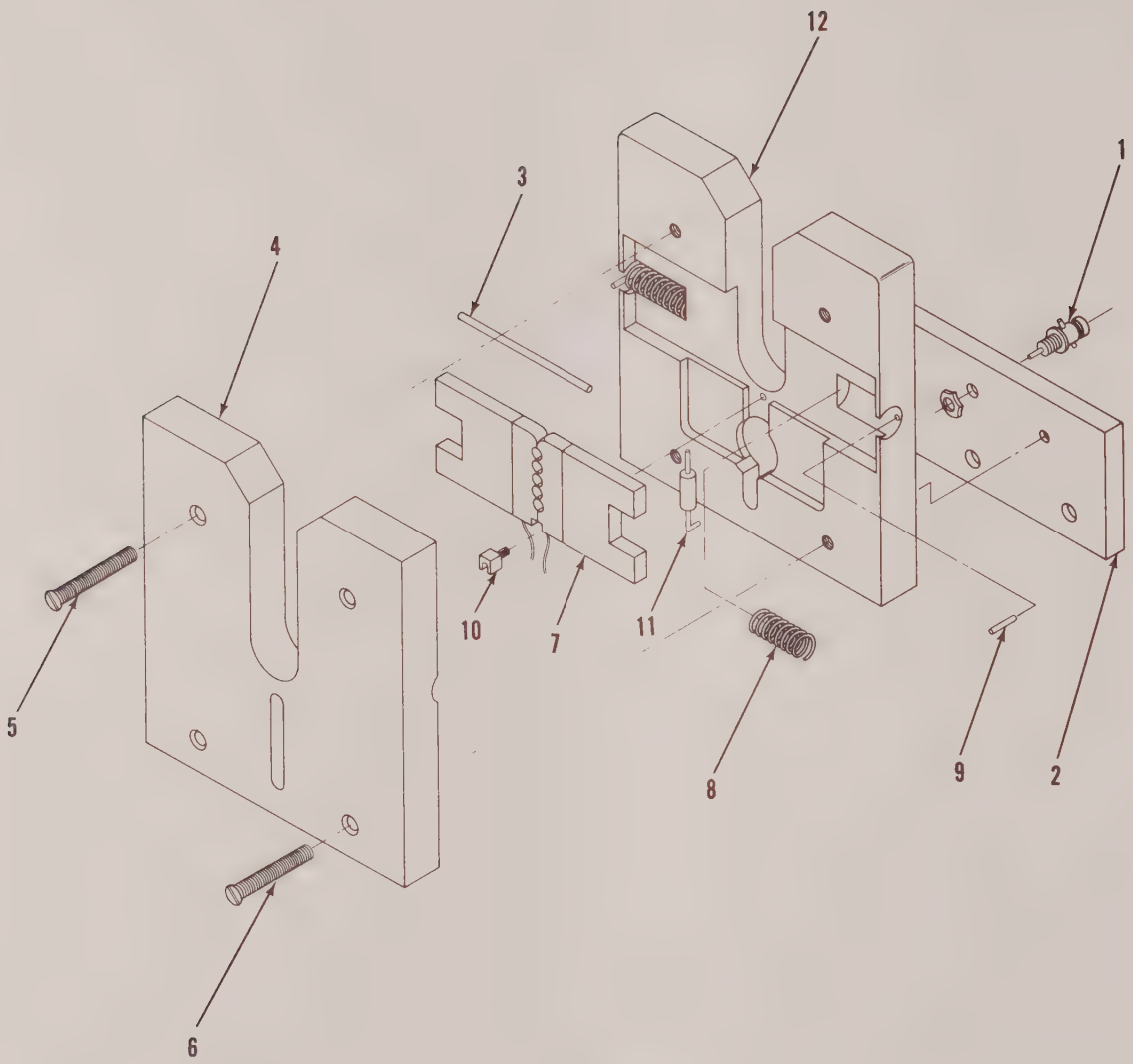

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Figure 7-11. Load Carriage Assembly

Figure & Index Number	Part Number	FSCM	1 2 3 4 5 6 7 Description	Units Per Assy	Usable On Code	SMR Code
7-11-	A3-06-0928	18560	LOAD CARRIAGE ASSEMBLY (See fig. 10 for NHA)	REF		
1	46025	02660	. CONNECTOR, Receptacle, ACR No. A1-16-0225	1		
2	A1-07-0757	18560	. GROUND PLATE, Carriage	1		
3	A1-17-0758	18560	. PIN, Indicator	1		
4	A1-18-0981	18560	. LOAD CARRIAGE, Left side	1		
5	MS51958-48	96906	. SCREW, Machine (AP)	2		
6	MS51959-47	96906	. SCREW, Machine (AP)	2		
7	A3-06-0942	18560	. CONTACT ASSEMBLY	2		
8	S-60	56988	. SPRING, Compression, ACR No. A1-05-0425	2		
9	MS16555-608	96906	. PIN, Dowel	1		
10	A1-05-0417	18560	. PIN, Connection	1		
11	RCR20G750J	81349	. RESISTOR, Fixed	1		
12	A1-18-0980	18650	. LOAD CARRIAGE, Right side	1		

7-3. NUMERICAL INDEX. To be provided at a later date.

7-4. REFERENCE DESIGNATION INDEX. To be provided at a later date.

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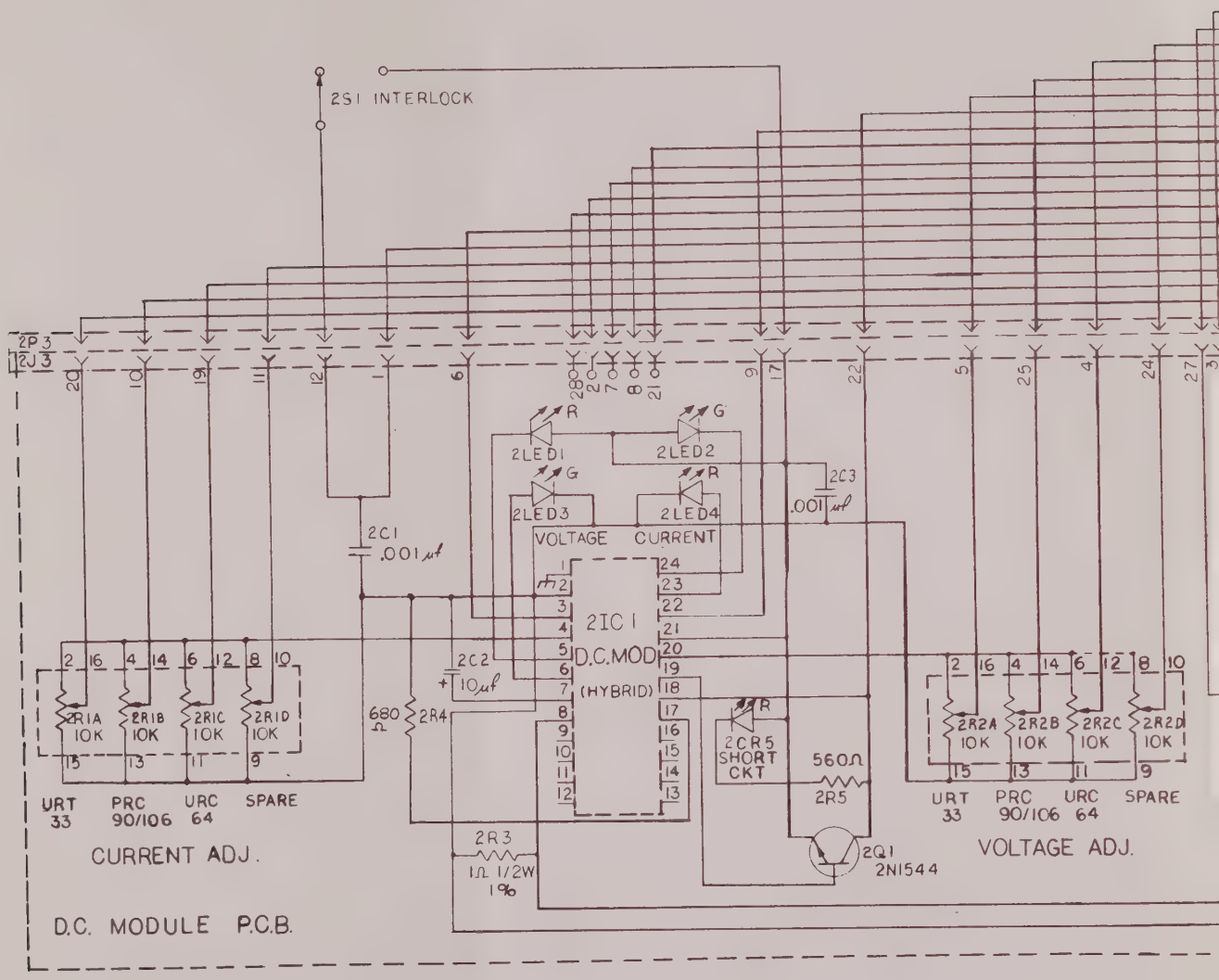
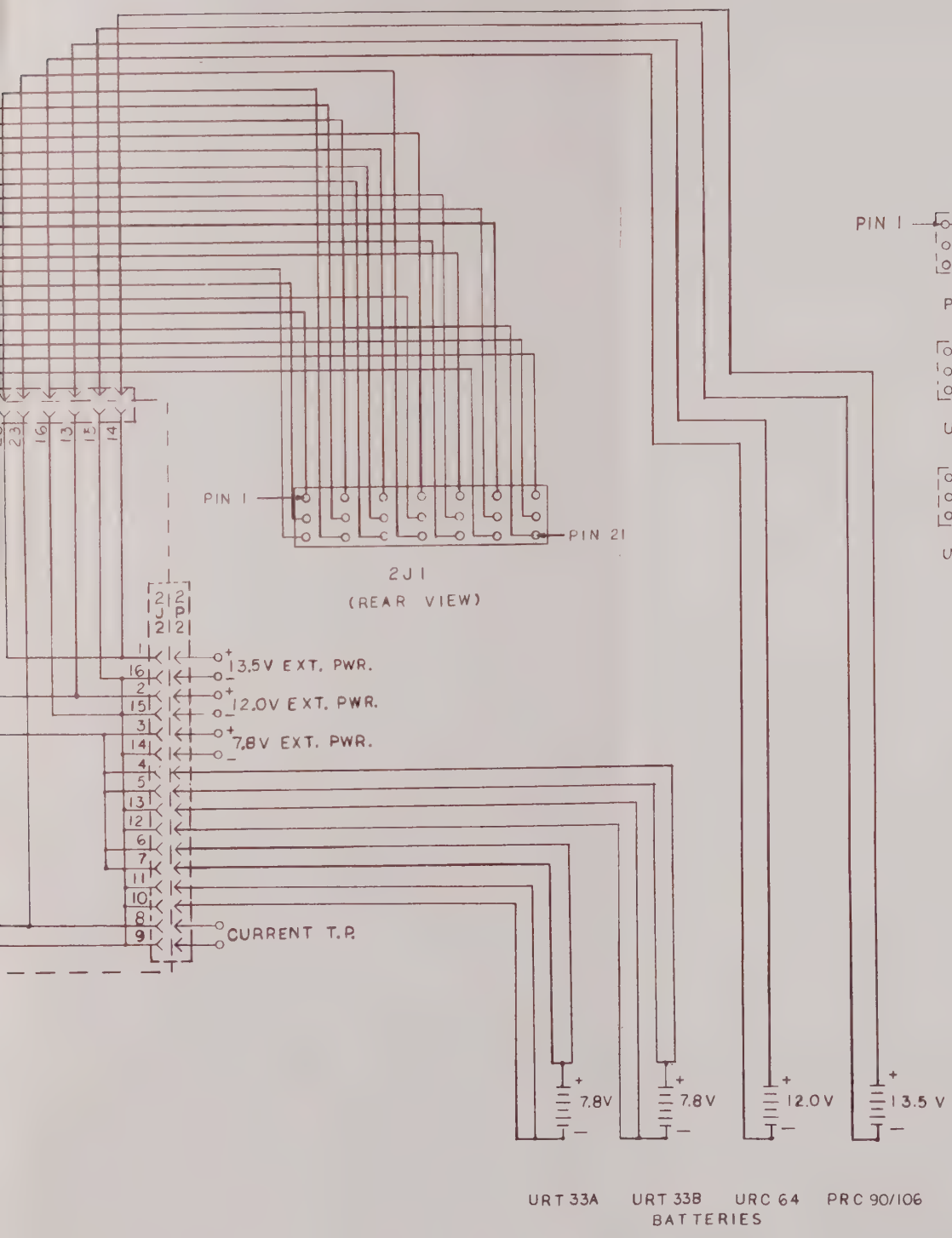


NOTE:

ALL RESISTORS ARE 1/4 W UNLESS OTHERWISE INDICATED



FO-1. DC Module Schematic

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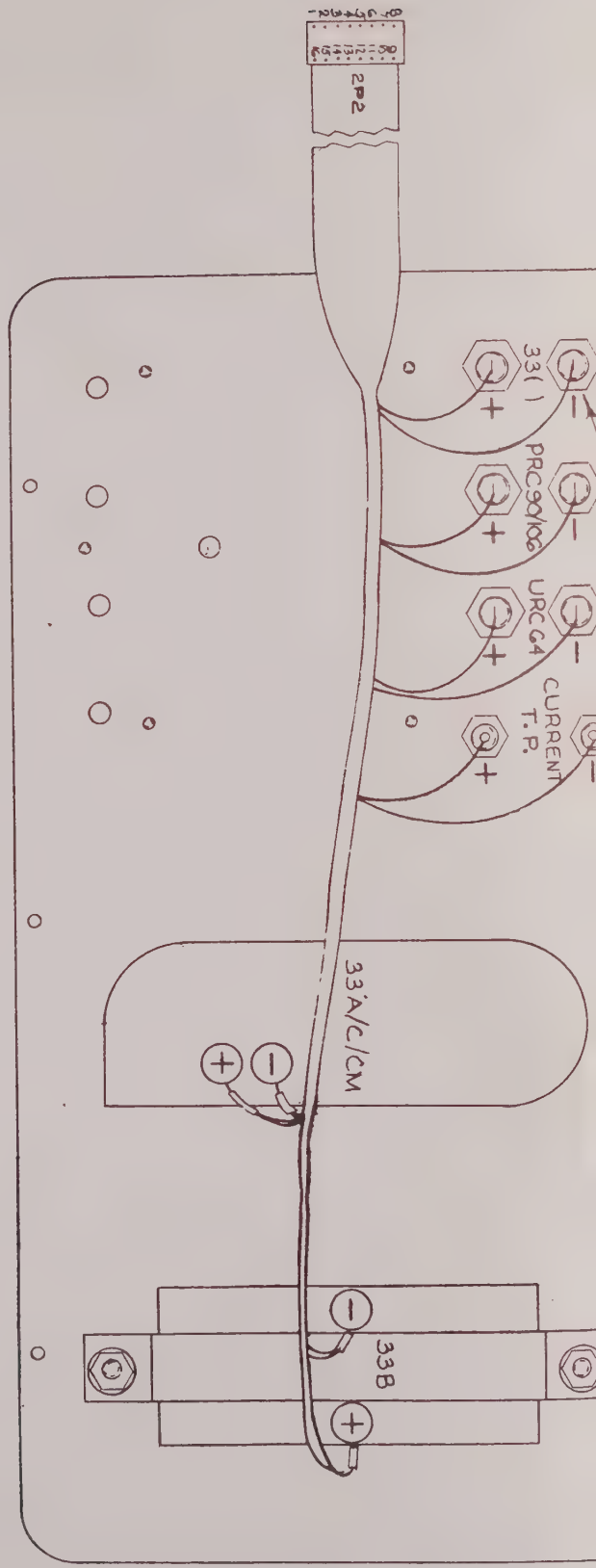
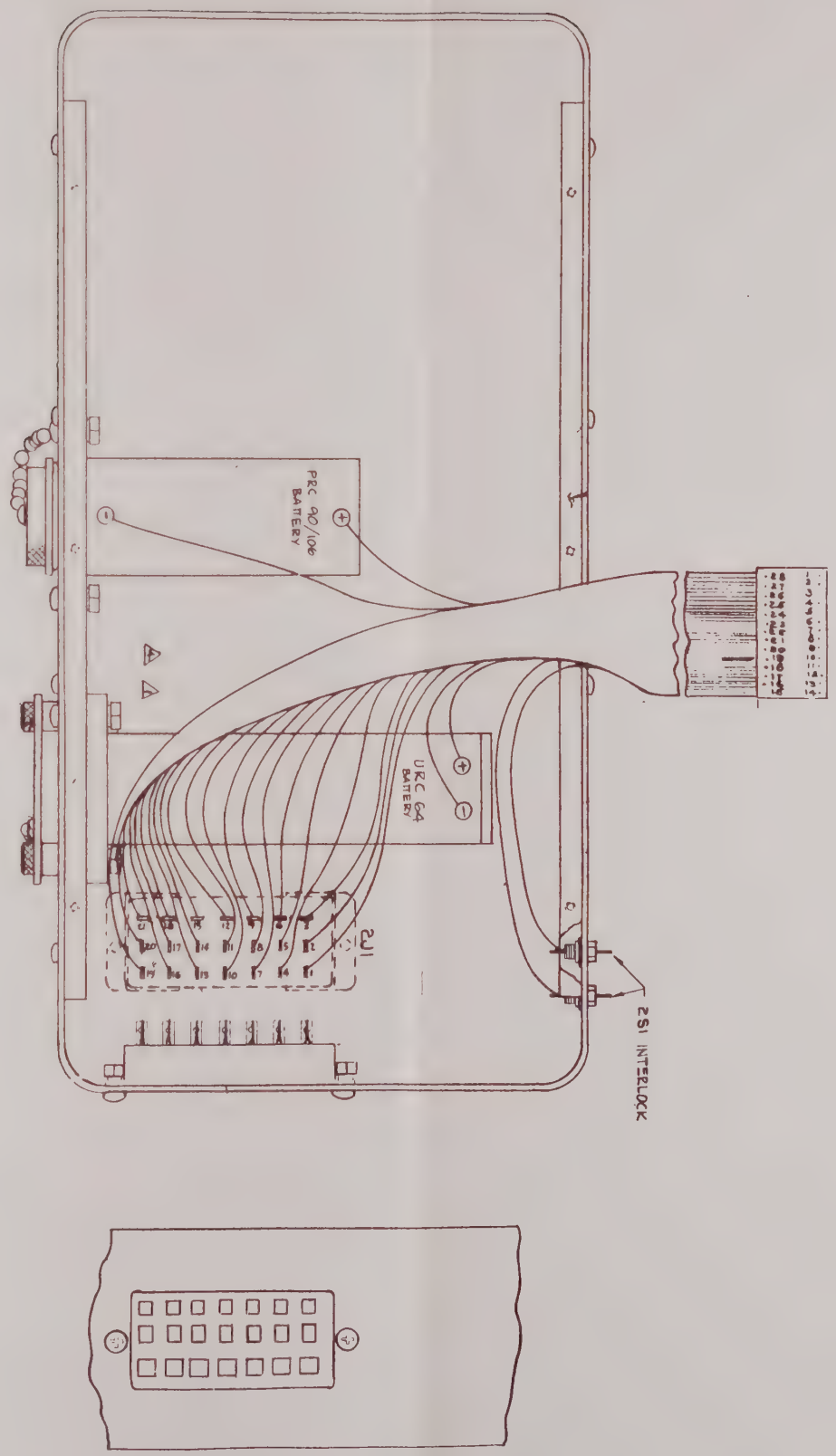
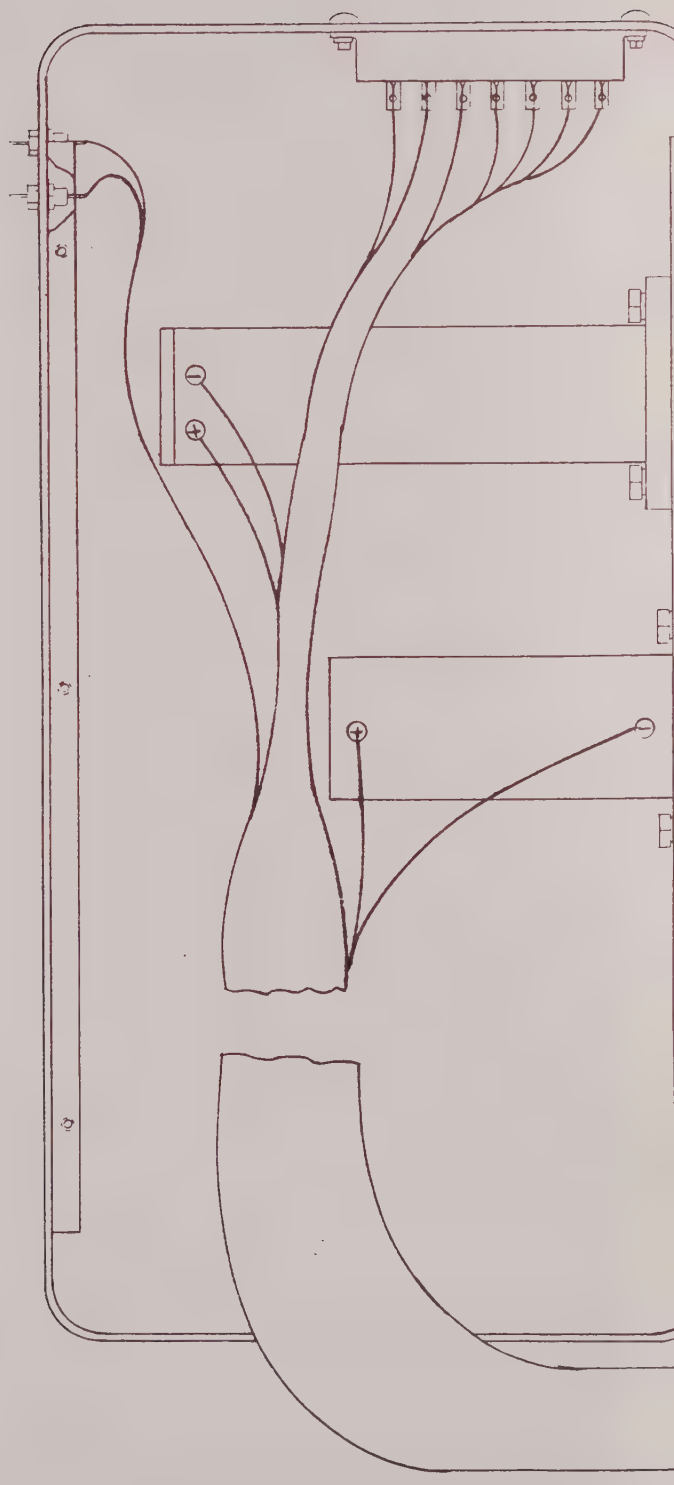
NO. 4,278,979

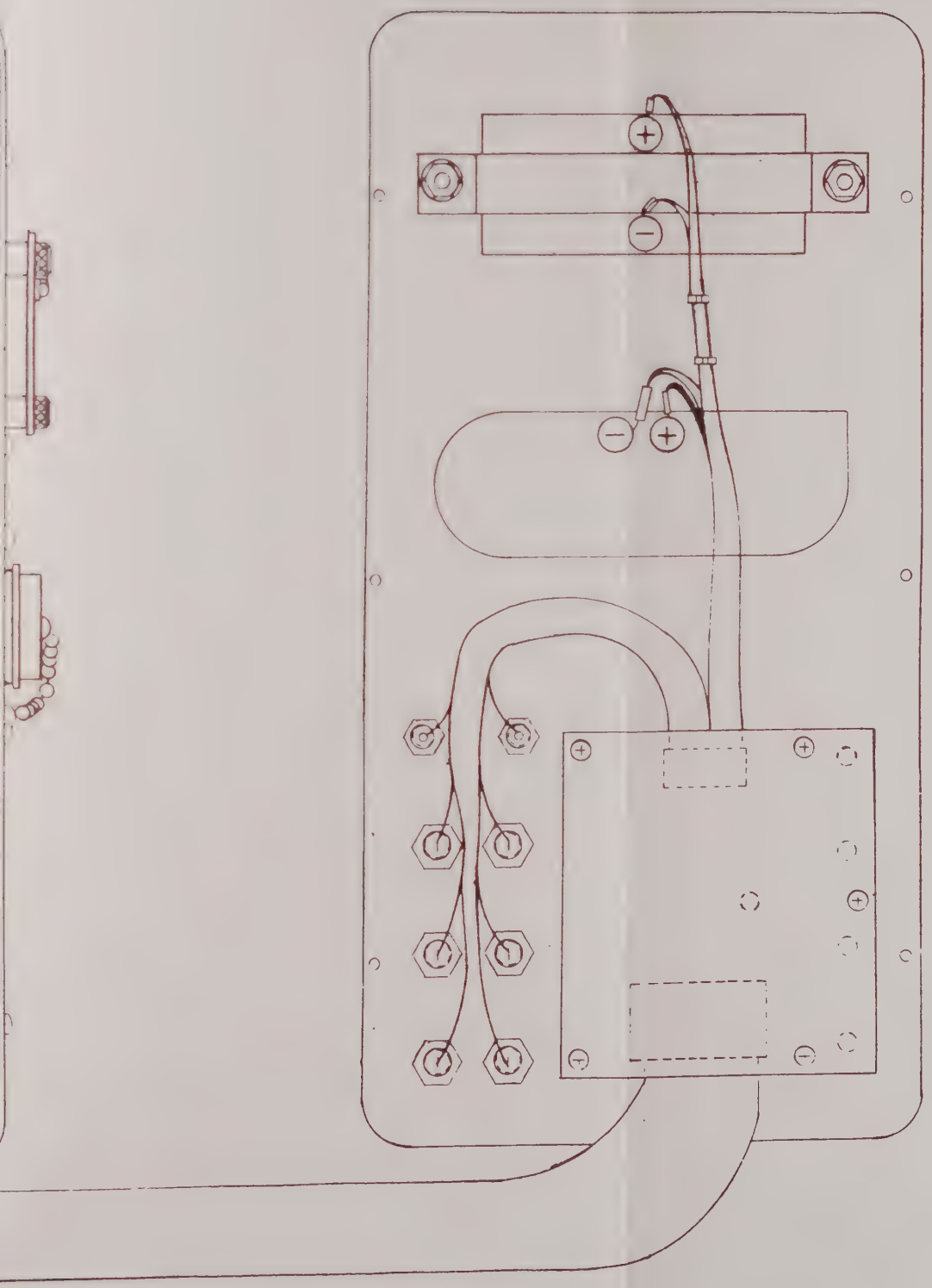




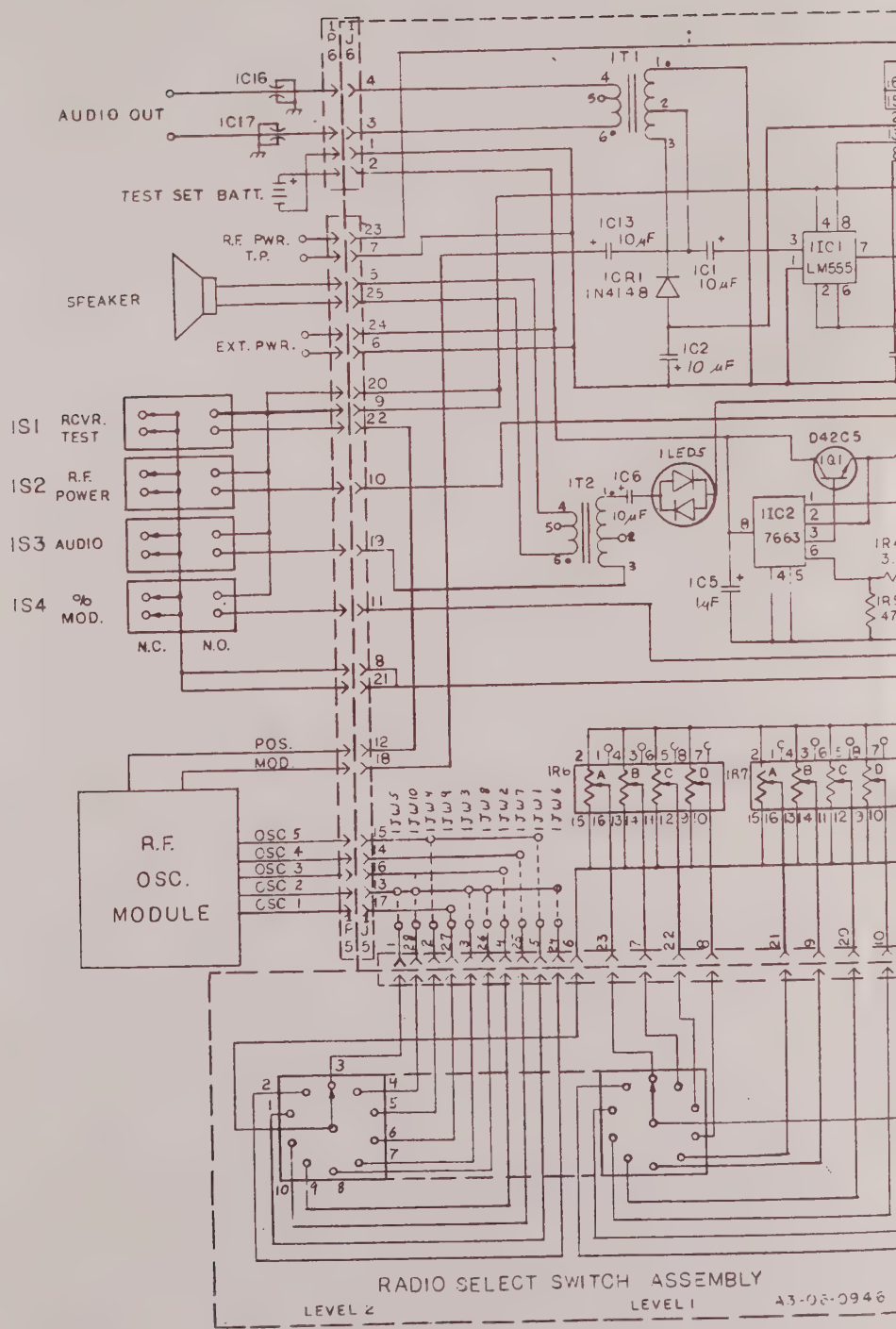
FO-2. DC Module Wiring Diagram
(Sheet 1 of 2)

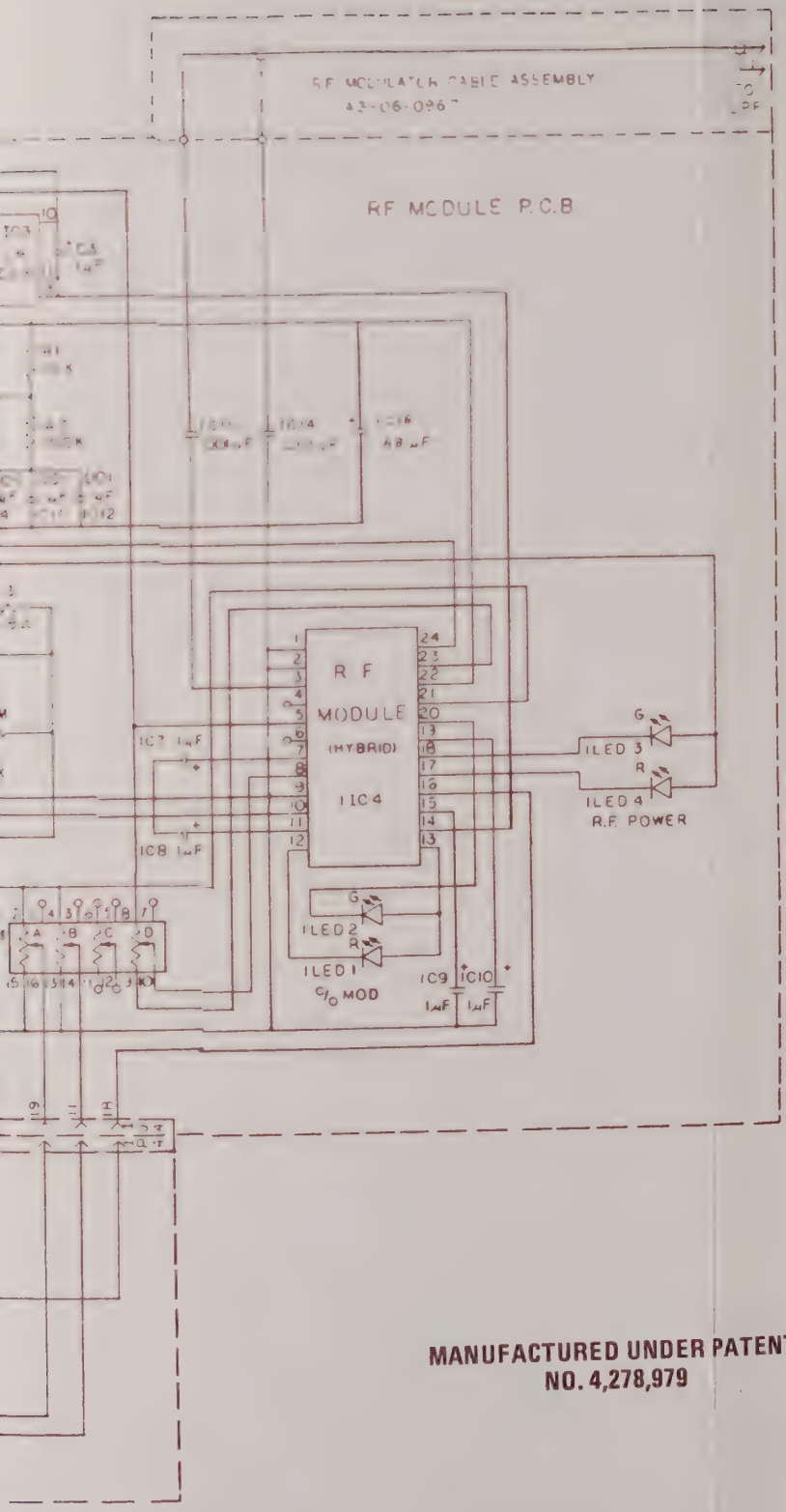
MANUFACTURED UNDER PATENT NO. 4,278,979





FO-2. DC Module Wiring Diagram
(Sheet 2 of 2)


AUDIO OUT
IC16
IC17
TEST SET BATT.
R.F. PWR. T.P.
SPEAKER
EXT. PWR.
IS1 RCVR. TEST
IS2 R.F. POWER
IS3 AUDIO
IS4 % MOD.
N.C.
N.O.
POS. MOD
R.F. OSC. MODULE
OSC 5
OSC 4
OSC 3
OSC 2
OSC 1
IT1
IC13 10μF
IC1 10μF
ICR1 IN4148
IC2 10μF
IC1 LM555
IT2
IC6 10μF
1LED5
D42C5
IC2 7663
IC5 1μF
IR6
IR7
RADIO SELECT SWITCH ASSEMBLY
LEVEL 2
LEVEL 1
43-03-0946



RADIO SELECT TABLE		
RADIO SELECT SWITCH POSITION NUMBER	RADIO	FREQUENCY
1	URC 64	282.8
2	URT 33	243.0
3	URT 33B	243.0
4	PRC 90	243.0
5	PRC 90	282.8
6	PRC 106	121.5
7	PRC 106	243.0
8	URC 64	243.0
9	URC 64	247.3
10	URC 64	246.2

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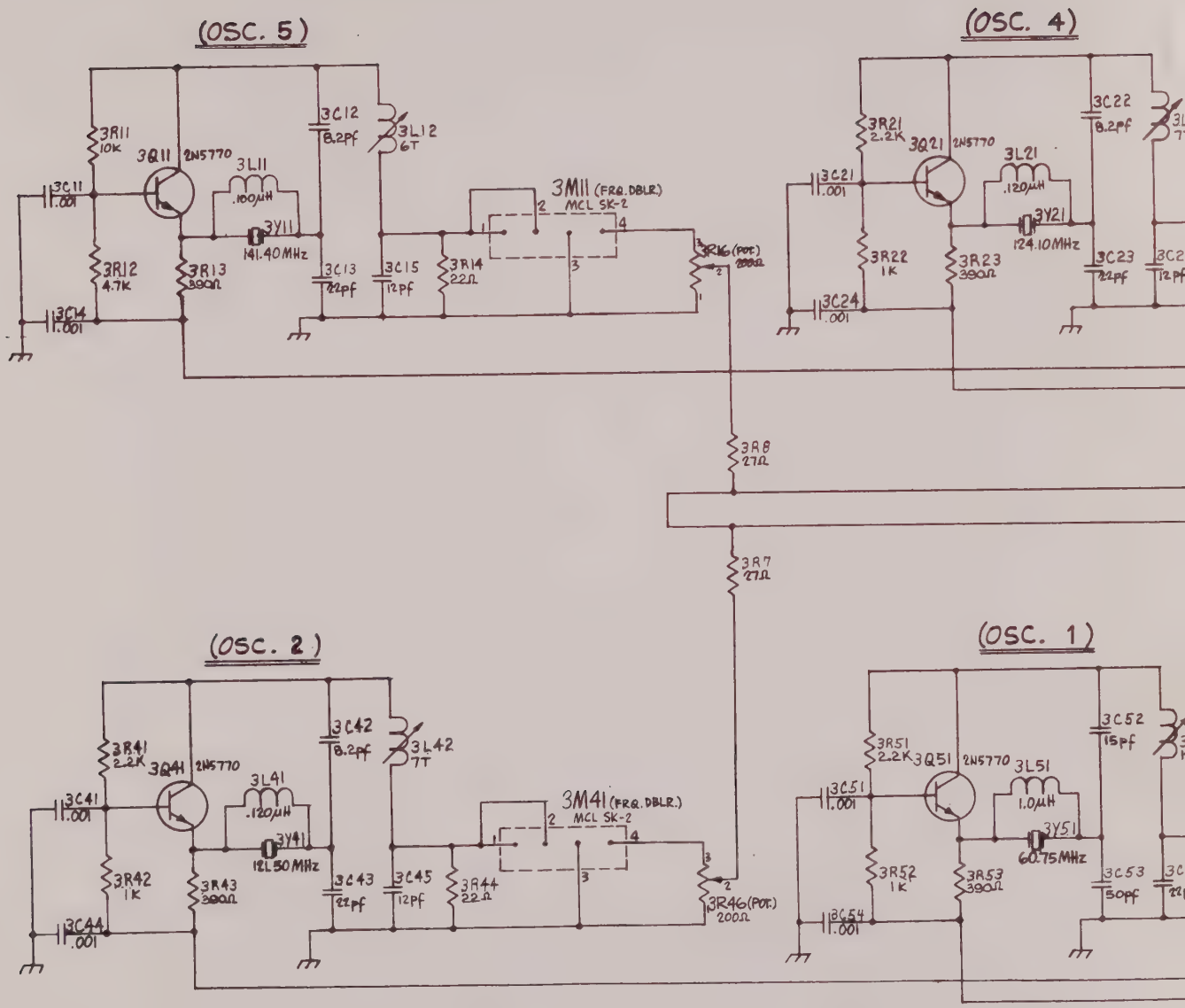
FO-3. RF Module Schematic



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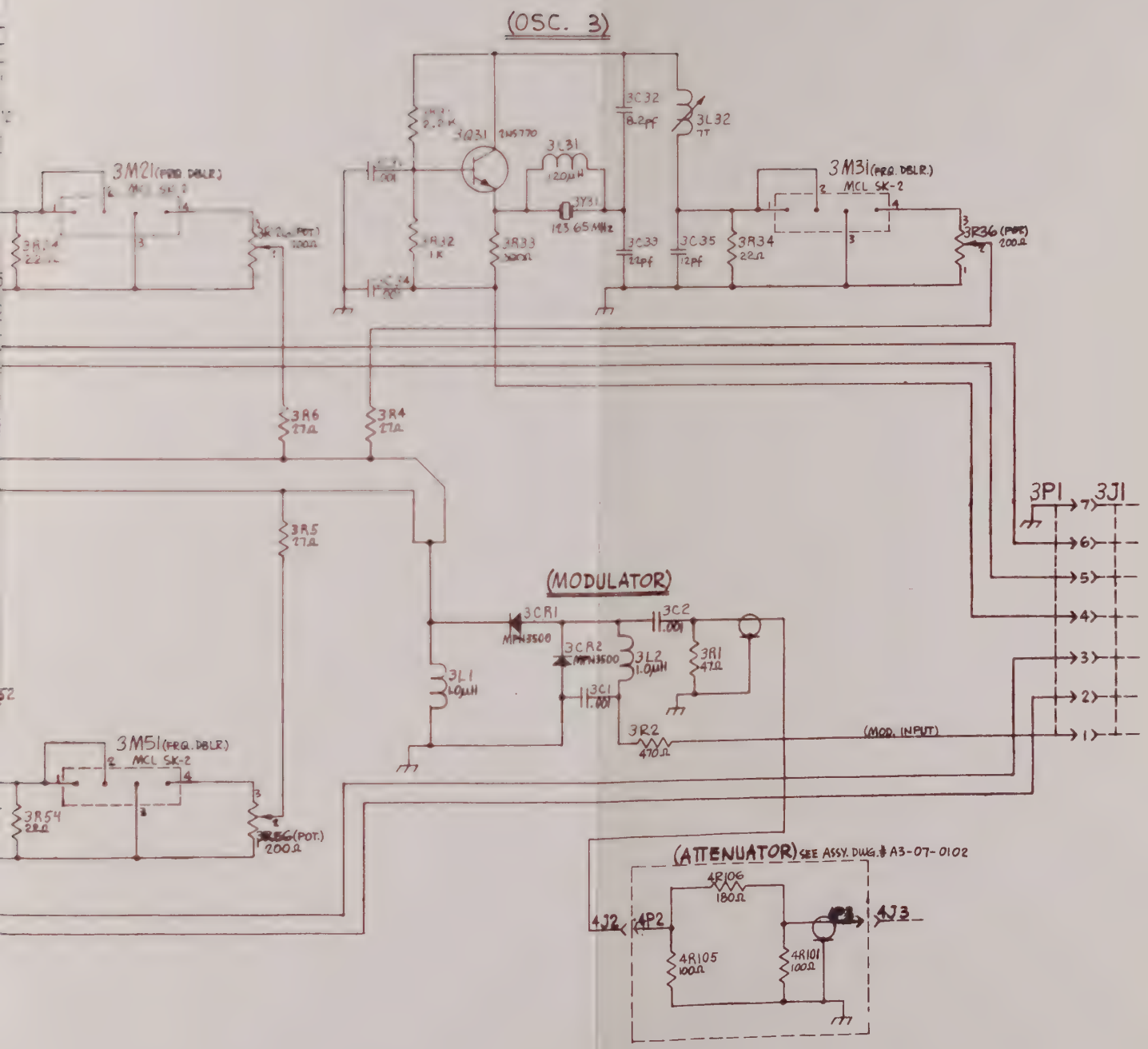
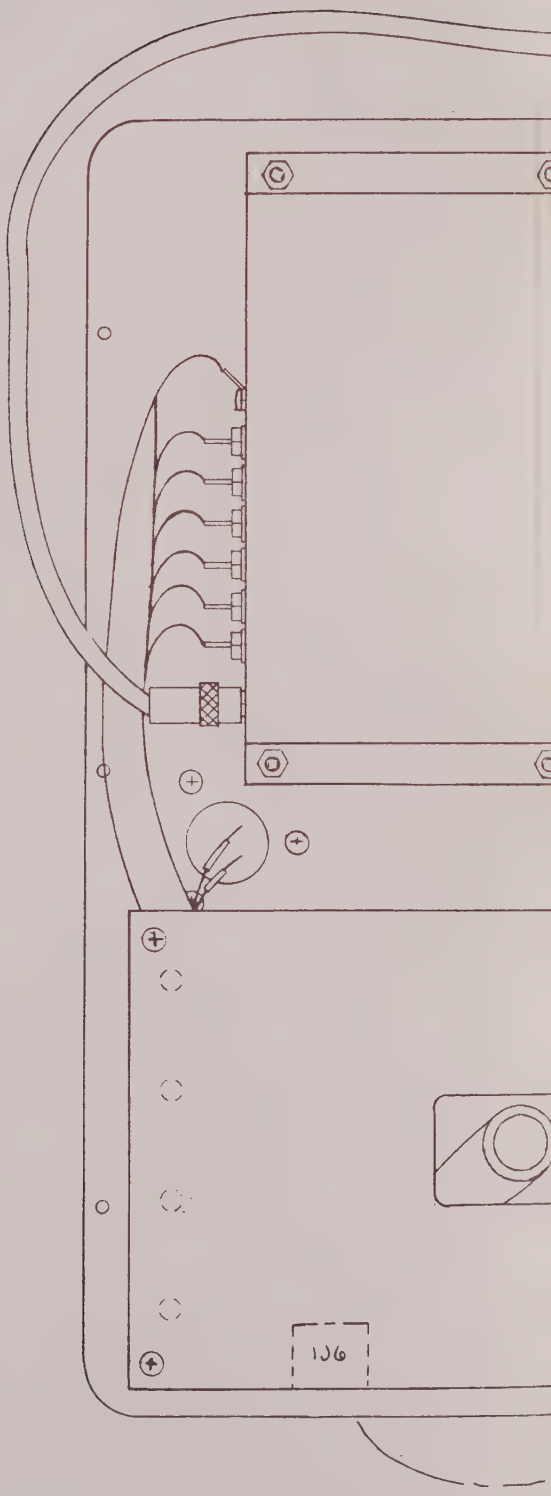
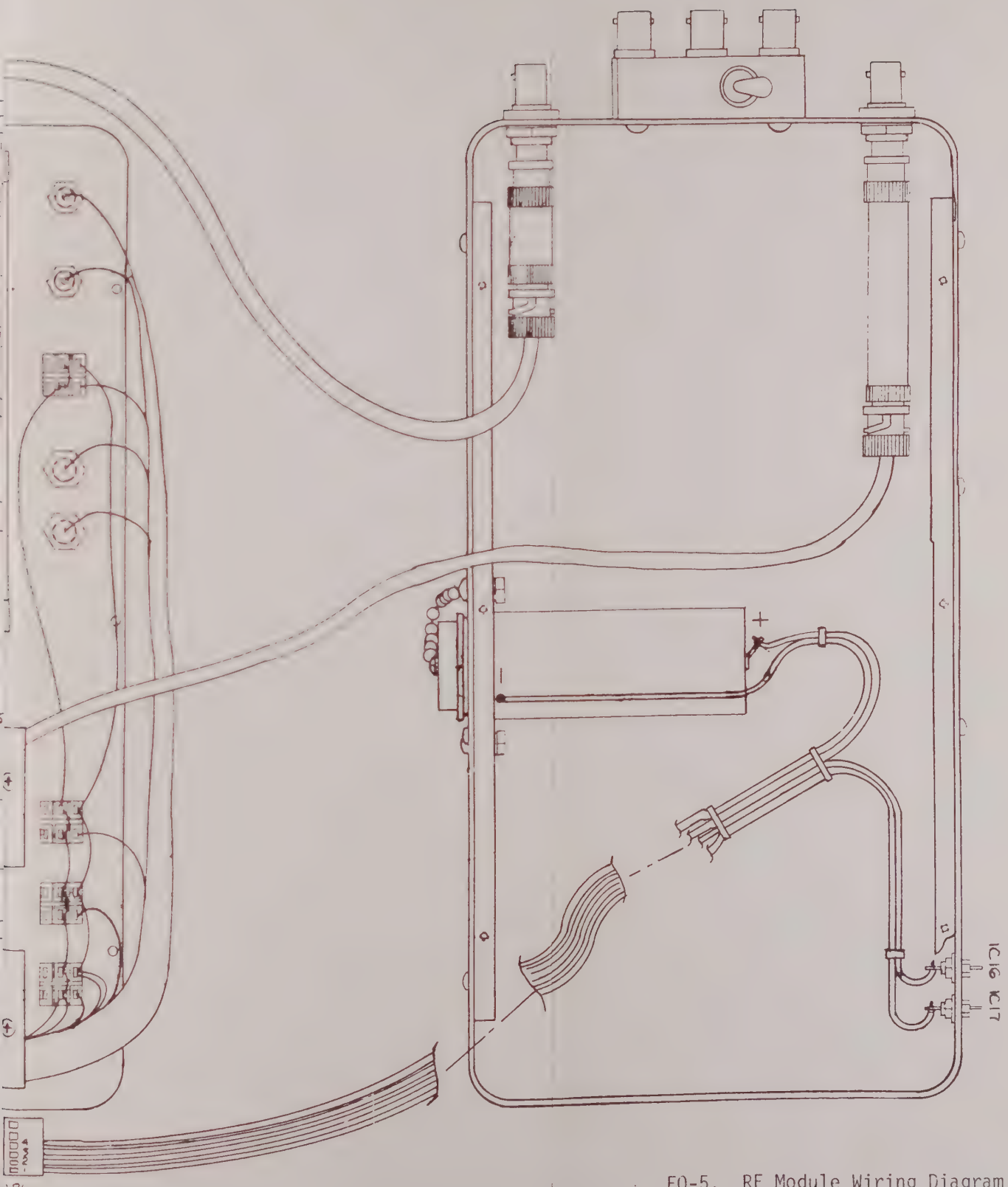
NO. 4,278,979



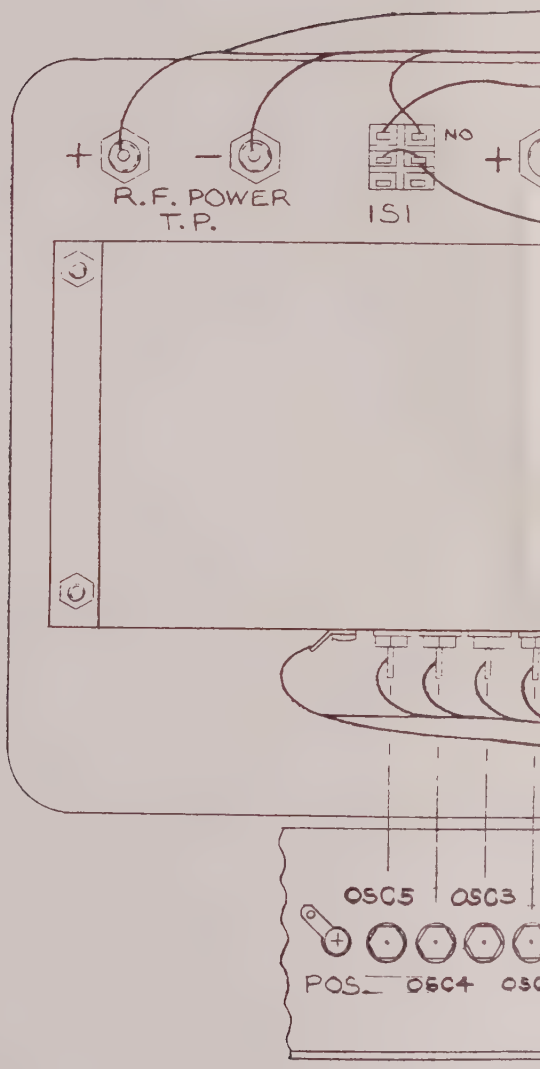
FO-4. RF Oscillator Schematic

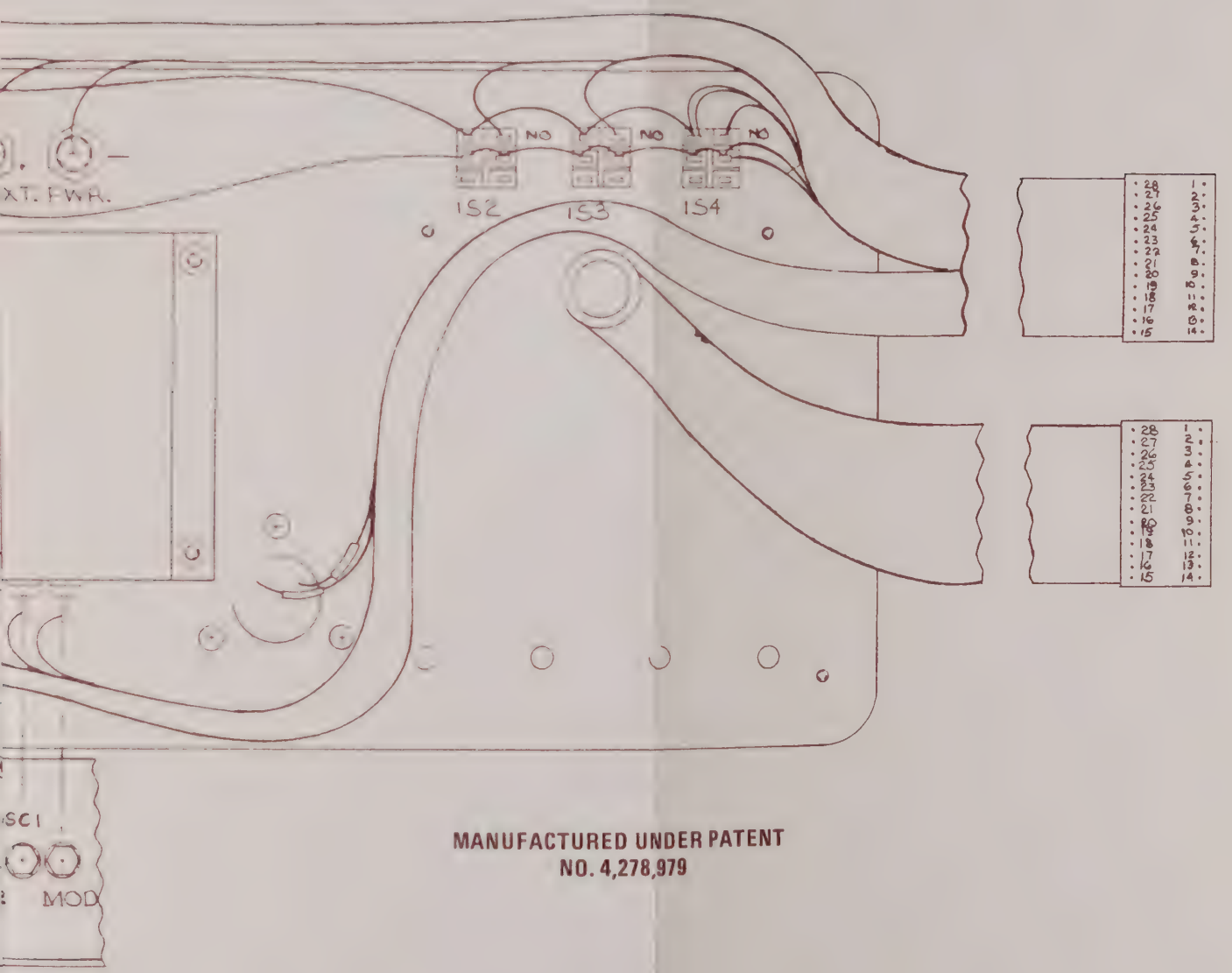
MANUFACTURED UNDER PATENT
NO. 4,278,979





FO-5. RF Module Wiring Diagram
(Sheet 1 of 3)


+
−
R.F. POWER
T.P.
NO
+
IS1
OSC5
OSC3
POS
OSC4



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FO-5. RF Module Wiring Diagram (Sheet 2 of 3)

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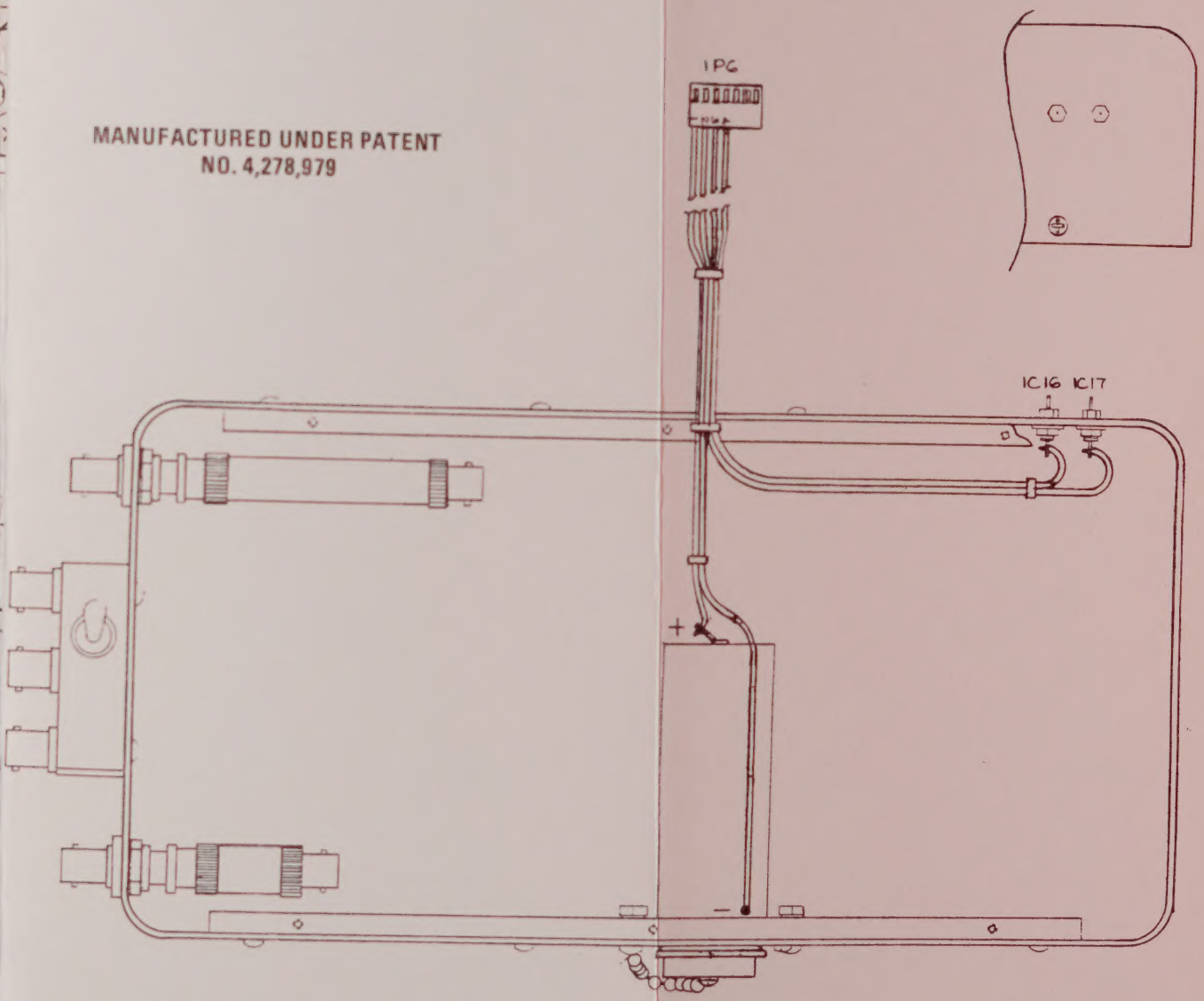

FO-5. RF Module Wiring Diagram
(Sheet 3 of 3)